

Joint Theater Trauma System Clinical Practice Guideline

PELVIC FRACTURE CARE

Original Release/Approval	18 Dec 2004	Note: This CPG requires an annual review.	
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Supersedes:	Pelvic Fracture Care, 30 Jun 2010		
<input type="checkbox"/> Minor Changes (or)	<input checked="" type="checkbox"/> <i>Changes are substantial and require a thorough reading of this CPG (or)</i>		
<input type="checkbox"/> Significant Changes	PI monitoring plan added		

1. **Goal.** To provide a brief review for the stabilization and treatment of pelvic fractures sustained in combat casualties.
2. **Background.**
 - a. Historically, injuries to the pelvis were relatively uncommon in the combat environment. The prevalence of Improvised Explosive Device (IED) attacks seen in the Iraq and Afghanistan operations against technologically improved tactical vehicles has led to an increased incidence of blunt trauma pelvic injuries. The patterns of pelvic fracture in the combat environment are different than the more easily characterized patterns in civilian trauma. KRG
 - b. Hemodynamically compromised patients with pelvic fractures present a complex challenge to the trauma team as fractured pelvic bones can induce brisk bleeding and can lacerate surrounding soft tissues. Furthermore, pelvic fractures often occur in conjunction with other life threatening injuries. Civilian mortality rates have ranged from 18% to 40%. Death within the first 24 hours of injury in these patients is most often a result of acute blood loss. Open pelvic fractures in the combat environment have become more common. These fractures frequently require operative fixation. Key issues in management of pelvic fractures are to identify if the patient is hemodynamically stable and if the pelvic fracture is stable. If the patient is not hemodynamically stable it is imperative to identify all site(s) of hemorrhage as pelvic fractures often occur in conjunction with other life threatening injuries. **Appropriate evaluation of the abdomen, chest, and other potential sites of injury and hemorrhage cannot be overstressed.** Additionally, a thorough examination of the pelvis and perineum is required to rule out associated injuries to the rectum and GU/GYN systems.
 - c. When pelvic fractures cause hemorrhage the bleeding occurs from three major sources: arterial, venous, and cancellous bone. Over 70% of hemorrhage associated with blunt pelvic trauma causing pelvic fracture is venous in nature and may be controlled with maneuvers that reduce the pelvic volume and stabilize the pelvis. The **other nearly 30% is associated with an arterial source and often requires procedural interventions such as surgical packing and/or embolization.** In the austere environment for open pelvic fractures that continue to bleed despite retroperitoneal packing, bilateral internal iliac artery ligation should be considered.⁷ In these dire circumstances, temporary cross-clamping of the aorta may help control life-threatening hemorrhage prior to dissection and ligation of the internal iliac arteries.

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- d. For pelvic fractures, stabilization with whatever means are available (sheet, bean or sand bags, or pelvic external fixation) must be promptly implemented. At Level II facilities and far forward locations, in situations where fracture stability is unclear and specialist expertise is not available to determine pelvic fracture stability, stabilization with a sheet or binder is recommended. When possible, correction of lower extremity external rotation by taping the knees and ankles together can improve the pelvic reduction achieved with a sheet or binder.

3. Evaluation and Treatment. (See [APPENDIX A](#))

- a. The establishment of standardized clinical treatment algorithms for patients with pelvic fractures has been shown to greatly increase the probability of rapid stabilization of trauma patients.
- b. The focus of the evaluation and treatment is early identification of injury with early mechanical stabilization as necessary and determination of hemodynamic instability with aggressive resuscitation for hemorrhage.
- c. A multidisciplinary approach with early trauma surgery and orthopedic surgery coordination is key.
- d. When available, angiographic exploration with early embolization by skilled interventionalist for the hemodynamically unstable patient with intrapelvic hemorrhage may be beneficial-preferably in the operating room. *Given that this capability is rarely available outside of a level III facility, the next most beneficial maneuver is retroperitoneal packing via a supra pubic incision.^{5,6} Attempts at opening a retroperitoneal pelvic hematoma (as a result of a pelvic fracture) from inside the abdomen should be resisted at all costs and attempted only as a last resort.* In the casualty who remains hemodynamically compromised in spite of these efforts bilateral iliac artery ligation should be considered.⁷ However, these interventions should not delay the necessary acute surgical treatment for concomitant hemorrhagic injuries.

4. Performance Improvement (PI) Monitoring.

- a. Intent (Expected Outcomes).
 - 1) At forward locations with providers who lack the expertise and resources for accurate placement of external pelvic fixation, pelvic stabilization is performed using sheets or binders.
 - 2) In patients with pelvic fractures who have negative FAST exam but remain unstable despite adequate resuscitation, DPL and/or exploratory laparotomy is performed.
- b. Performance/Adherence Measures.
 - 1) When expertise and resources were lacking at forward locations, pelvic stabilization was performed using sheets or binders.
 - 2) In patients with pelvic fractures who had negative FAST exam but continued hemodynamic instability despite adequate resuscitation, DPL and/or exploratory laparotomy was performed.

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c. Data Source.

- 1) Patient Record
- 2) Joint Theater Trauma Registry (JTTR)

d. System Reporting & Frequency.

The above constitutes the minimum criteria for PI monitoring of this CPG. System reporting will be performed annually; additional PI monitoring and system reporting may be performed as needed.

The system review and data analysis will be performed by the Joint Theater Trauma System (JTTS) Director, JTTS Program Manager, and the Joint Trauma System (JTS) Performance Improvement Branch.

- 5. Responsibilities.** It is the trauma team leader's responsibility to ensure familiarity, appropriate compliance and PI monitoring at the local level with this CPG.

6. References:

- ¹ *Emergency War Surgery Handbook*
- ² Smith W, Williams A, Agudelo J, et al. *Early Predictors of Mortality in Hemodynamically Unstable Pelvis Fractures*. *J Orthop Trauma*. 2007;21(1):31-37
- ³ Biffi W, Smith W, Moore E, et al. *Evolution of a Multidisciplinary Clinical Pathway for the Management of Unstable Patients with Pelvic Fractures*. *Annals of Surgery*. 2001;233(6):843-850
- ⁴ Hak D, Smith W, Suzuki T. *Management of Hemorrhage in Life-threatening Pelvic Fracture*. *J Am Acad Orthop Surg*. 2009;17:447-4
- ⁵ Smith WR, Moore EE, Osborn P, et al. *Retroperitoneal packing as a resuscitation technique for hemodynamically unstable patients with pelvic fractures: report of two representative cases and a description of technique*. *J Trauma* 2005 Dec;59(6):1510-4
- ⁶ Osborn PM, Smith WR, Moore EE, et al. *Direct retroperitoneal pelvic packing versus pelvic angiography: A comparison of two management protocols for haemodynamically unstable pelvic fractures*. *Injury* 2009 Jan;40(1):54-60
- ⁷ DuBose J, Inaba K, Barmparas G, Teixeira PG, Schnuriger B, Talving P, Salim A, Demetriades D. *J Trauma* 2010 Dec;69(6):1507-1514

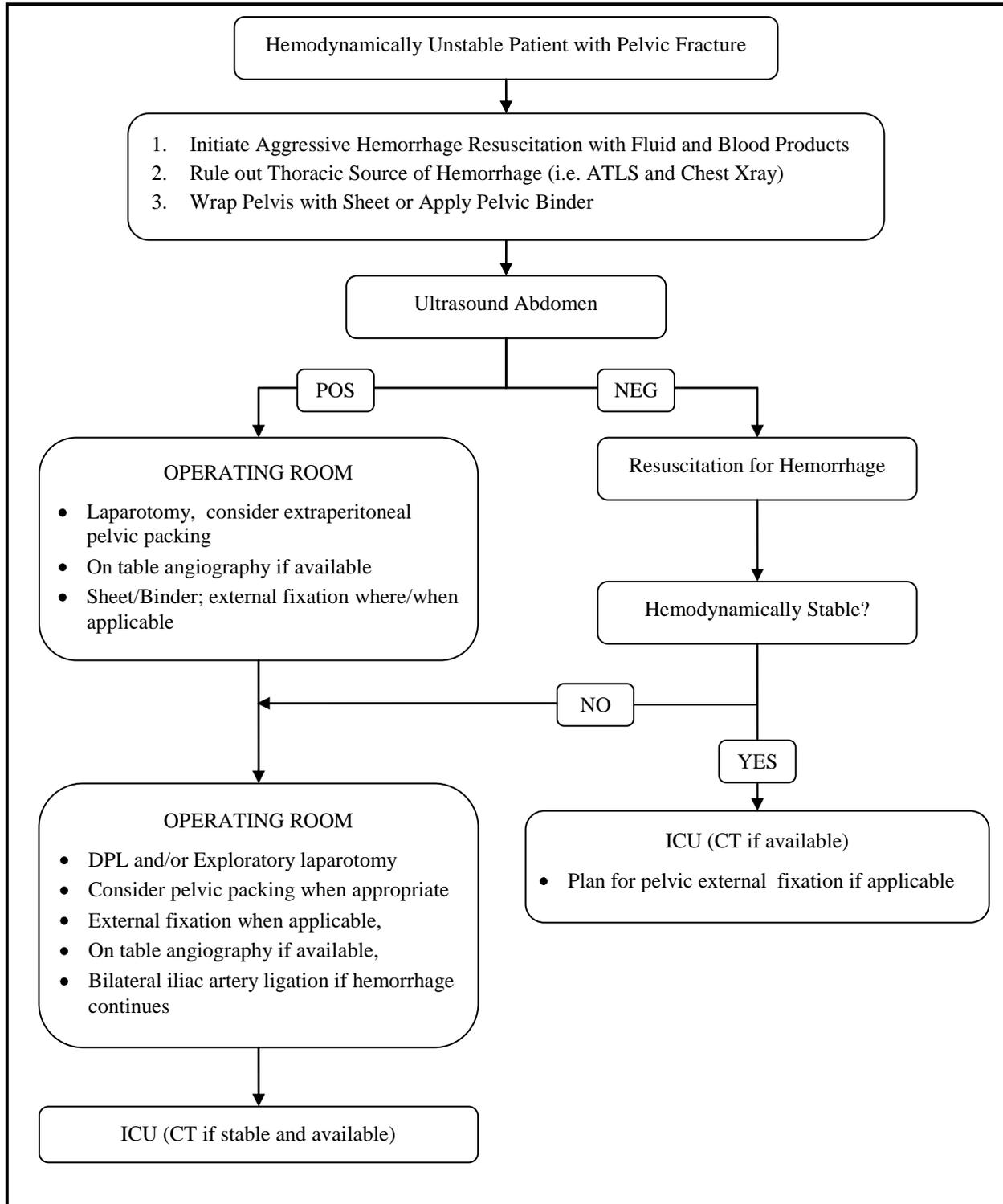
Approved by CENTCOM JTTS Director,
JTS Director and CENTCOM SG

Opinions, interpretations, conclusions, and recommendations are those of the authors and are not necessarily endorsed by the Services or DoD.

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APPENDIX A

PELVIC FRACTURE CLINICAL PATHWAY



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APPENDIX B

ADDITIONAL INFORMATION REGARDING OFF-LABEL USES IN CPGs

1. Purpose.

The purpose of this Appendix is to ensure an understanding of DoD policy and practice regarding inclusion in CPGs of “off-label” uses of U.S. Food and Drug Administration (FDA)–approved products. This applies to off-label uses with patients who are armed forces members.

2. Background.

Unapproved (i.e., “off-label”) uses of FDA-approved products are extremely common in American medicine and are usually not subject to any special regulations. However, under Federal law, in some circumstances, unapproved uses of approved drugs are subject to FDA regulations governing “investigational new drugs.” These circumstances include such uses as part of clinical trials, and in the military context, command required, unapproved uses. Some command requested unapproved uses may also be subject to special regulations.

3. Additional Information Regarding Off-Label Uses in CPGs.

The inclusion in CPGs of off-label uses is not a clinical trial, nor is it a command request or requirement. Further, it does not imply that the Military Health System requires that use by DoD health care practitioners or considers it to be the “standard of care.” Rather, the inclusion in CPGs of off-label uses is to inform the clinical judgment of the responsible health care practitioner by providing information regarding potential risks and benefits of treatment alternatives. The decision is for the clinical judgment of the responsible health care practitioner within the practitioner-patient relationship.

4. Additional Procedures.

- a. Balanced Discussion. Consistent with this purpose, CPG discussions of off-label uses specifically state that they are uses not approved by the FDA. Further, such discussions are balanced in the presentation of appropriate clinical study data, including any such data that suggest caution in the use of the product and specifically including any FDA-issued warnings.
- b. Quality Assurance Monitoring. With respect to such off-label uses, DoD procedure is to maintain a regular system of quality assurance monitoring of outcomes and known potential adverse events. For this reason, the importance of accurate clinical records is underscored.
- c. Information to Patients. Good clinical practice includes the provision of appropriate information to patients. Each CPG discussing an unusual off-label use will address the issue of information to patients. When practicable, consideration will be given to including in an appendix an appropriate information sheet for distribution to patients, whether before or after use of the product. Information to patients should address in plain language: a) that the use is not approved by the FDA; b) the reasons why a DoD health care practitioner would decide to use the product for this purpose; and c) the potential risks associated with such use.

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