

Trauma Clinical Guideline

Initial Management of Major Pelvic Fractures

The Trauma Medical Directors and Program Managers Workgroup is an open forum for designated trauma services in Washington State to share ideas and concerns about providing trauma care. The workgroup meets regularly to encourage communication among services and to share best practices and information to improve quality of care. On occasion, at the request of the Emergency Medical Services and Trauma Care Steering Committee, the group discusses the value of specific clinical management guidelines for trauma care.

The Washington State Department of Health distributes this guideline on behalf of the Emergency Medical Services and Trauma Care Steering Committee to assist trauma care services with developing their trauma patient care guidelines. Toward this goal the workgroup has categorized the type of guideline, the sponsoring organization, how it was developed, and whether it has been tested or validated. The intent of this information is to assist physicians in evaluating the content of this guideline and its potential benefits for their practice or any particular patient.

The Department of Health does not mandate the use of this guideline. The department recognizes the varying resources of different services and that approaches that work for one trauma service may not be suitable for others. The decision to use this guideline depends on the independent medical judgment of the physician. We recommend that trauma services and physicians who choose to use this guideline consult with the department regularly for any updates to its content. The department appreciates receiving any information regarding practitioners' experience with this guideline. Please direct comments to 360-236-2874.

This is a trauma assessment and management guideline. It was adapted from professional literature. The workgroup reviewed the guideline, sought input from trauma care physicians throughout Washington State, and used that input to make changes. Both the Emergency Medical Services and Trauma Care Steering Committee and the Department of Health Office of Community Health Systems endorsed the guideline. This guideline has not been tested or validated.

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Problem:

Pelvic fractures occur as a result of high energy forces such as motor vehicle crashes (MVC), falls from heights, and crushing forces. The elderly are at risk of pelvic fractures from lower energy forces such as ground level falls. Pelvic fractures make up a relatively small percent of overall injuries but the mortality rate is high, between 5 and 30 percent.

Generally, pelvic fractures are grouped into three categories based on the pattern of injury. They include lateral compression, anterior-posterior compression, and vertical shearing. Lateral compression fractures result more frequently, occurring in 60 to 70 percent of patients. Anterior-posterior compression (open book) occurs in 15 to 20 percent of patients, followed by vertical shearing occurring in 5 to 15 percent of patients.

Pelvic fractures are further classified as either stable or unstable. Stable fractures are those that do not involve the pelvic ring and have minimal displacement. Unstable fractures occur when the pelvic ring is broken in two or more places with displacement. In any regard, pelvic fractures are considered life threatening because of the risk of vascular disruption and resulting blood loss. Significant arterial injury occurs in about 20 percent of pelvic fractures. Unstable fractures are particularly dangerous because the pelvic compartment with fractures has limited ability to self-tamponade bleeding vessels. Pelvic fractures with associated systolic blood pressure less than 90 are linked to a 40 percent mortality rate.

Assessment:

The high-energy forces associated with pelvic fractures frequently result in other body system injuries. Some of these associated injuries may be more life threatening than the pelvic fracture. To ensure injuries are identified appropriately, a systematic approach should be taken when assessing these patients. This systematic approach should follow the advanced trauma life support (ATLS) process, which includes the primary and secondary survey. In the severely injured patient, examination of the pelvis should be performed once by an experienced provider. The pelvis should be palpated by applying gentle pressure over the iliac crest downward and medially. If a pelvic fracture is present, this maneuver will usually result in an unstable movement, crepitus, and pain. Other assessment findings could include shortening of the leg, blood at the urinary meatus, hematuria, and unexplained hypotension. Rectal and vaginal exams should be performed to assess for blood and possible open fracture. Open pelvic fractures have a higher mortality rate nearing 50 percent. Patients with altered mental status may contribute to the overlooking of pelvic fracture, making the assessment information above and diagnostic studies very important.

Diagnostic studies:

An initial focused assessment sonography for trauma (FAST) exam should occur immediately in the hemodynamically unstable patient with symptoms of shock. If positive for intraabdominal fluid the patient should receive an immediate surgical consult and transferred to the operating room (OR). If surgical services are unavailable the patient should be resuscitated and immediately transferred to a higher designated trauma service with surgical services.

If a pelvic fracture is suspected a plain film X-ray of the pelvis should be obtained as soon as possible. If the patient is stable a computed tomography (CT) scan should be obtained to aid in diagnosis. The use of contrast will aid in the diagnosis and help determine the extent of vessel damage. A type and cross match should be obtained as soon as possible because of the potential need for transfusion. A complete blood count should also be obtained to help determine the degree of blood loss. A urine sample will help determine hematuria.

Treatment:

In addition to the treatment modalities in the primary survey, pelvic fractures associated with hemodynamic instability should be stabilized with a circumferential sheet wrap or commercially available temporary pelvic binder (TPB). Hemodynamically stable patients may be sheet wrapped or have a TPB placed for comfort during transport. If prolonged transport time is expected, keep in mind these devices could potentially cause tissue damage. In these situations, consult with an orthopedic surgeon to confer the need for placement of these devices, thus eliminating the risk.

The correct placement of the sheet or binder will ensure pelvic stability and help control the pelvic compartment size, which can assist in bleeding control. The sheet or the binder should be centered and applied across the greater trochanter to a snug fit. See [Appendix A](#) for proper application of the sheet. If commercially made pelvic binders are used follow the manufacture recommendations.

The high-energy forces generally associated with pelvic fractures places the patient at increased risk of concomitant injuries, which increases the potential for hypovolemic shock. The trauma team should be prepared to hemodynamically resuscitate the patient using the massive transfusion protocol (MTP). Sources of treatable blood loss should be controlled as soon as possible.

If bleeding continues with signs of hemodynamic instability, early referral to interventional radiology with emergent pelvic angiography is recommended. Trauma services without angiography should transfer to the nearest higher level designated trauma service with angiograph capability.

If no appropriate surgical services are available to care for the patient's injuries, early and rapid transfer should occur. If transferring the patient, it may be helpful to reference the [interfacility transport guideline](#). It is not necessary to transport the patient on a spine board. The cervical collar should be left in place if cervical injury has not been ruled out.

References

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- Feliciano, D., Mattox, K., Moore, E., Trauma (6th ed.). (2008). New York: McGraw Hill.
- Prasarn, M. L., Small, J., Conrad, B., Horodyski, N., Horodyski, M., & Rechtine, G. R. (2013). Does Application Position of the T-POD Affect Stability of Pelvic Fractures?. *Journal of Orthopaedic Trauma*, 27(5), 262-266 5p. doi:10.1097/BOT.0b013e31826913d6

Appendix A.

Stabilizing the Pelvis Fracture

Sheet method

1. Procedure will require multiple staff members
2. Fold sheet smoothly 10 inches wide.
3. Log roll patient maintaining c-spine precautions.
4. Carefully center under the patient bisecting the greater trochanters.
5. Log roll patient maintaining c-spine precautions to supine position.
6. Wrap running ends around the pelvis to a snug fit (requires two staff members)
7. Hold sheet tightly in place while a second person Kelly clamps the sheet together in all four corners.
8. [Video](#) (recommended)

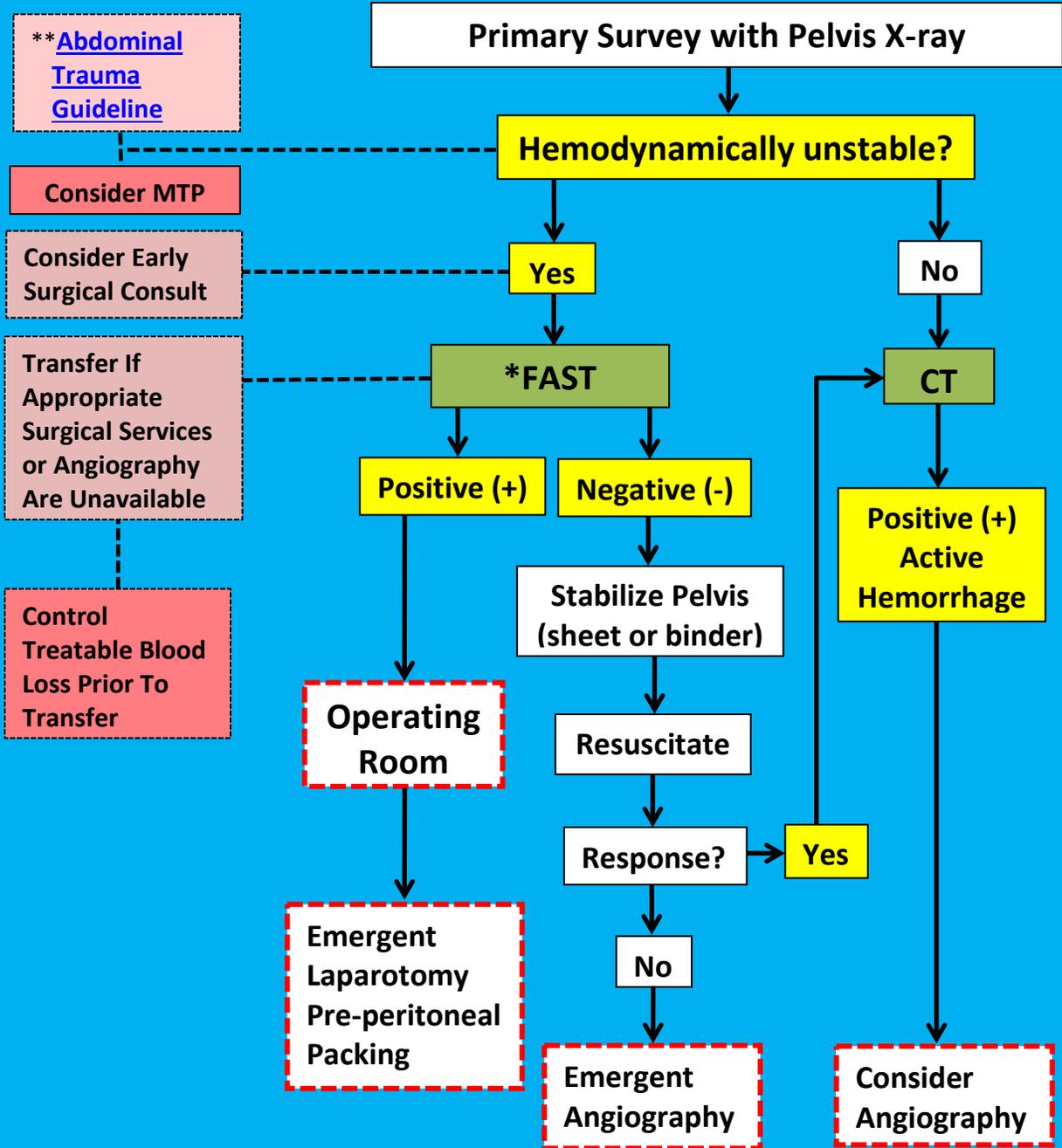


Images courtesy of Harborview Medical Center

Commercial devices

1. Use manufacture instructions and recommendations
2. Useful links
 - [Sam Pelvic Sling](#)
 - [T-POD Pelvic Stabilization Device](#)
 - [Pelvic Binder](#)
 - [Hip Hugger](#)

Initial Management of Major Pelvic Fracture Algorithm



- ### Secondary Survey Key Points
- Negative FAST requires another diagnostic exam (X-ray, CT)
 - Resuscitate before going to CT
 - Check temperature and provide warming measures
 - Neurological exam to identify spinal injuries
 - Administer pain control medications
 - Log-roll to assess spine and open fractures
 - Rectal and vaginal exams to assess for open fracture
 - Foley catheter (do not place Foley if blood at meatus, floating prostate, or resistance; obtain retrograde urethrogram)
 - X-ray of pelvis and adjoining areas
 - Reduce hip dislocation if present
 - Monitor for signs of continued bleeding

- ### Stabilize Pelvis
- Circumferential sheet or pelvic binder
 - Further stabilize pelvic girdle with pillows or rolled blankets

* FAST – Focused Abdominal Sonography for Trauma
 ** If possible abdominal injury See [Abdominal Trauma Guideline](#)