

Pelvic Fracture Management: Temporary Application and Care of Pelvic Stabilization Device

Site Applicability

- Emergency Departments (EDs) and Health Centers
- VCH Intensive Care Units (ICUs)
- VGH Burns, Trauma, High Acuity Unit (BTHA)

Practice Level

Profession	Speciality Basic Competency (for Critical Care Specialty Certificate or High Acuity Training or Equivalent or Emergency Nursing Certificate or equivalent)	Speciality Advanced Competency (for Emergency Nursing Specialty Certificate or Equivalent) with <u>additional education</u> *
Registered Nurse (RN)	• Management of Pelvic Stabilization Device	• Application of Pelvic Stabilization Device

Additional Education*

- With site-specific orientation to care for trauma patients

Need to Know

Consent

- Informed consent from the Client or their Substitute Decision Maker prior to providing health care is legally required by the Health Care (Consent) and Care Facility (Admission) Act, subject to exceptions set out in law. Staff must communicate in ways that are sensitive to the unique abilities of each Client in order to support their ability to understand information (e.g. using a professional translator when needed).

The purpose of this decision support tool (DST) is for guidance on the application and management of the T-POD Pelvic Stabilization Device for patients with suspected or confirmed pelvic fractures.

Pelvic binders are an important step in controlling bleeding from pelvic fractures. Products such as the T-Pod[®] can be used in the pre-hospital or emergency department setting (Hsu J, Chen W, et al. (1) Arrow[®] T-POD[™] Pelvic Stabilization Device. Teleflex; 2017).

Although pelvic fractures represent only about 3% of all skeletal injuries, (Nguyen et al. (3)) they carry a high risk of intra-abdominal injury, severe bleeding, and mortality (Yoshihara & Yoneoka (6)). Among patients with multiple injuries due to blunt trauma, 5–16% sustain pelvic ring injuries, with a mortality rate ranging from 11% to 54%, primarily due to hemorrhagic shock (Hsu, Chen, et al (1)). Massive hemorrhage is the leading cause of death in these cases, making early intervention and treatment critical to achieving optimal patient outcomes (Nguyen et al. (3)).

The application of a pelvic binder induces a circumferential pressure on the pelvis (Privalov et al., (4)). This leads to mechanical stabilization of the pelvic ring, reduction of fracture fragments, decrease in intrapelvic volume and increase in intrapelvic pressure (Privalov et al., (4)).

The T-POD Pelvic Stabilization Device offers several key features that enhance its usability and safety. It is **radiolucent**, meaning it does not need to be removed for X-rays, MRIs, or CT scans, ensuring seamless imaging compatibility. Additionally, the device is **latex-free**, reducing the risk of allergic reactions, and it is designed for **single-patient** use to maintain sterility and prevent cross-contamination.

Quick links: Contraindications

[Hip and Femur fractures](#)

[Pregnancy](#)

[Pediatrics](#)

[Obesity](#)

Equipment and Supplies

Using clinical judgement and in collaboration with the [Most Responsible Provider \(MRP\)](#), the RN may use T POD or flat sheet.

- **T-POD Pelvic Stabilization Device** ([Appendix A](#))
- **Flat sheet** ([Appendix B](#))
 - Securing device i.e. metal [kelly clamps](#) or [zap straps](#)

Guideline

Assessment

- Gather equipment: pelvic stabilization device (T-pod or sheet), trauma scissors, gloves, other stabilization tools as needed.
- Patient positioning: Supine with care to maintain spinal precautions if necessary.
- Ensure familiarity with the pelvic anatomy and device positioning.
- If instability is identified, the physician will maintain pressure until the pelvic binder is in place.

Do not remove or loosen the device to perform skin checks underneath it.

Manual Pelvic Stabilization (Pre-Binder):

1. Position yourself at the patient's side or at the level of the pelvis.
2. Place your hands over the iliac crests (not the abdomen).
3. Apply gentle inward pressure, not forceful, just enough to stabilize and prevent movement.
4. Maintain manual stabilization until the pelvic binder is correctly placed.

Application:

1. Communication: If a trauma team is involved, closed-loop communication is essential to coordinate the application and ensure patient safety
2. Expose the Pelvis: Cut away clothing while maintaining patient dignity, using blankets to cover exposed areas.

Application of T-POD:

1. Place the Device: Slide fabric belt under patient. Orange side facing out. Align the center of the T-POD or sheet across the greater trochanter. See Application ([Appendix C](#)).
2. Ensure stability of other injury (or injuries) such as maintaining c-spine alignment if rolling patient to place.
3. Wrap the Belt: Secure the T-POD belt snugly around the pelvis centered at the greater trochanter, ensuring even distribution ([Appendix C](#)).
4. Cut to fit patient, leave 6–8-inch gap between each end.
5. Apply Velcro attachment.
6. Tighten the Device: Use the tensioner system to cinch the device, avoiding over-compression. Secure once adequate stabilization is achieved.
7. Secure by using hooks and attach pulley to Velcro.
8. Check Placement: Confirm correct positioning and stabilization by ensuring no lateral movement of the pelvis.

Application of [Flat sheet](#):

1. Select Flat sheet:
 - Use a standard hospital **flat sheet** (not a fitted sheet).
 - Fold it lengthwise until it's about 6–8 inches wide.
2. Ensure stability of other injury (or injuries) such as maintaining c-spine alignment if rolling patient to place.
3. Position Patient: Lay the patient flat with legs straight. Log-roll if needed to slide the sheet under.
4. Place the Sheet at the Greater Trochanters: Position the sheet low across the pelvis, at the level of the greater trochanters (just below the hip bones), not the waist.
5. Secure the Sheet: If possible, try to avoid using metal clamps (e.g., Kelly clamps) as they interfere with CT imaging. Instead, secure the sheet using:
 - a. A strong knot off to the side
 - b. Plastic clips if available (i.e., zip ties)
 - c. A windlass technique with trauma shears or a rolled gauze (non-metal) to maintain tension
6. Check Placement: Confirm correct positioning and stabilization by ensuring no lateral movement of the pelvis.

Monitoring

- Regularly assess for skin integrity, pressure points, and circulation in the lower extremities and genitalia as per unit specific assessment and documentation guidelines.
- Closely monitor and trend hemodynamic status (blood pressure, heart rate, oxygen requirements), signs of ongoing hemorrhage (e.g., monitoring hemoglobin level) and pain using

a validated pain scale. Escalating or uncontrolled pain may indicate complications. If hemodynamically unstable, contact most responsible physician (MRP).

- Skin checks should occur as per unit specific assessment and documentation guidelines and be documented every 12 hours (q shift) – if the binder needs to be loosened to complete this, follow site process to contact MRP.
- Assess for potential compression of the genitalia neurovascular assessment to lower extremities per unit specific assessment and documentation guidelines

Re-assessment

- Ensure the device remains secure, especially during patient transfers or repositioning.
- T-POD or sheet should remain in place until an order is received by a [trauma surgeon](#) (or MRP) or surgical intervention is completed.
- Recommended time to surgery is 24hrs (up to 72 hours when prolonged transport occurred and hemodynamically stable).

Nurse Accompaniment for Higher Level of Care (HLC) transfers and to imaging (e.g., CT or MRI)

- Patients with pelvic binders must be escorted by a registered nurse for all transports.
- Use a **slider board** or **repositioning sheet** for lateral transfers with minimal pelvic movement.
- A **ceiling lift** can be used **with caution**, ideally in conjunction with a calmshell

Troubleshooting/Considerations

Foley Catheter Insertion:

If a catheter has not been inserted prior to pelvic binder application, consult with the MRP. Foley catheter insertion can typically be done without issue in males, but for females, temporary release of the binder may be necessary while another trained health care provider or nurse maintains manual pelvic stability.

Femoral Artery/Vein Access:

A notch can be cut in the fabric of the T-POD® to allow access to the groin area for femoral artery or vein access. Consider alternative sites for venous and arterial access.

Displacement of Binder:

If the binder becomes displaced (such as transferring the patient), readjustment should be performed with a qualified physician present to ensure proper positioning.

- Assess for hemodynamic instability, document actions taken, and record the patient's condition and response.

Accidental Removal of Velcro Attachment or Pulley System:

- If the fabric belt is still in place under the patient:
 - Trained health care provider or RN can manually hold the pelvis and attempt to re-secure the Velcro attachment.
 - Assess for hemodynamic instability, document actions taken, and record the patient's condition and response.
- If the fabric belt becomes displaced:

- Manually hold the pelvis, apply a flat sheet ([Appendix B](#)) as a temporary binder, and secure it with clamps.
- Notify the physician and order an X-ray to ensure proper stabilization.
- Assess for hemodynamic instability, document actions taken, and record the patient's condition and response.

Contraindications

Hip and Femur Fractures

The T-POD is designed to stabilize the pelvis in cases of suspected pelvic ring or open book fractures, but its use may be contraindicated in hip or proximal femur fractures. Applying the T-POD in such cases may inadvertently compress the hip or femur, aggravating the fracture, causing increased pain, or further displacing fracture fragments. If a patient has a mid-shaft femur fracture as well, the pelvic binder should take priority. The femur may be reduced and splinted without traction applied against pelvis.

Pregnancy

Pregnant individuals, particularly in the second and third trimesters, face distinct anatomical and physiological challenges. The application of a T-POD could exert undue pressure on the uterus, which may compromise fetal blood flow or even lead to placental abruption if the device is incorrectly positioned. Therefore, modifications in application technique and careful monitoring are essential when using the device in pregnancy. If a pelvic binder is indicated in pregnancy, position the binder across the femurs (as high as possible without putting pressure on the uterus). This will transmit compression into the pelvis (through the hips).

- The binder should still be placed **at the level of the greater trochanters**, not higher—even in the third trimester.
 - This may feel low, but it is anatomically correct and effective for stabilizing the pelvis.
- Be cautious about **uterine displacement** in later pregnancy. If needed, manually displace the uterus to the left during resuscitation to reduce aortocaval compression.

Pediatrics

Children less than 50 lbs. (23 Kg) may be too small to obtain the 6-inch gap needed for closure. If the ends of the T-POD® overlap, it will not be effective in stabilizing the pelvis. For kids under ~50 lbs, **use a folded sheet** instead of a commercial binder.

- Place the sheet at the level of the **greater trochanters**, not the iliac crests.

Wrap tightly and secure with clamps or knots to maintain compression.

Obesity

If an obese patient requires T-POD®, two belts may be affixed together using one power unit as an extender and the other as the pulley. If the abdomen is preventing proper landmarking, the pelvic binder can be placed lower (similar to pregnant patients).

Documentation

- If applicable, name of physician who applied, time, date.
- Record the time of application, patient's response, and any complications.
- Patient's neurovascular status (bilateral lower extremity pulses/capillary refill/sensation).

- Patient's pain and any interventions and result of interventions.
- Skin condition prior to application (e.g., absence or presence of redness or breakdown).
- While device is on, surrounding skin checked (absence or presence of redness or breakdown).
- Hemodynamics (blood pressure, heart rate, respiratory rate, oxygen saturation, and any oxygen requirement).

Cerner Sites ED Adults and Pediatrics:

Emergency Departments:

- ED Adult or Pediatrics Systems Assessment, Musculoskeletal

Critical Care (ICU/BTHA):

- Adult Critical Care Systems Assessment 2, Musculoskeletal
- PICU Systems Assessment, Musculoskeletal

Note: Please continue to document neurovascular status (such as pulses, capillary refill, and sensation in both lower limbs), pain, any interventions along with their outcomes, and skin condition as part of the regular head-to-toe assessment.

Patient and Family Education

[Trauma Informed Practice and Indigenous Cultural Safety:](#) use a trauma-informed approach and provide appropriate, equitable and culturally safe care.

Reassurance of Safety: Emphasize that the device is radiolucent, meaning it does not interfere with X-rays, CT scans, or MRIs, so it does not need to be removed during imaging.

Expected Duration of Use: Explain that the device will stay in place until the patient is transferred to the operating room or the trauma physician or MRP decides it is no longer needed.

Monitoring for Discomfort: Inform the family that nursing staff will regularly check the patient's skin for any signs of pressure or breakdown. Encourage them to notify the nurse if they observe the patient in discomfort or if the binder appears out of place.

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Limitations on Movement: Explain the importance of keeping the patient's pelvis stable. Advise family members not to try to adjust the patient's position or move the binder.

Encouraging Rest and Recovery: Reassure the family that the T-POD will help manage pain and stabilize the injury until definitive treatment is provided. Encourage them to help keep the patient calm and still, minimizing unnecessary movements.

Follow-Up Care: Provide information on the next steps in care, such as surgical intervention or further imaging, and the expected timeline for recovery. Reassure them that the team will keep them updated on the patient's progress.

Related Documents

- [NURSING Pelvic Fractures](#). Pirrung, J., Mower-Wade, D. (2014). Early Treatment and Recognition in Pelvic Fractures. Nursing. Lippincott Williams & Wilkins.
- [Flat Sheet Application](#). Retrieved September 30, 2024. Harbourview Medical Center Seattle, Washington. Trauma Center.
- [Management of pelvic ring injury in adults with hemodynamic instability](#) Clinical Practice Guideline Trauma Services British Columbia.

Related Policies

- [Indigenous Cultural Safety](#)

Guidelines/Procedures/Forms

- [Cervical Precautions: Three Person Turn](#)
- [Emergency Department: Nursing Assessment and Documentation Guideline – Adult and Pediatric](#)
- [HAU Assessment and Documentation Protocol with CST Cerner](#)
- [ICU Assessment and Documentation Protocol with CST Cerner](#)
- [Thoracic and/or Lumbar Spine Injuries: Two Person Turn](#)
- [Trauma Informed Practice](#)

References

1. Hsu SD, Chen CJ, Chou YC, Wang SH, Chan DC. Effect of early pelvic binder use in the emergency management of suspected pelvic trauma: a retrospective cohort study. *Int J Environ Res Public Health*. 2017 Oct 12;14(10):1217. doi:10.3390/ijerph14101217
2. Jowett L, Bowyer G. Pressure characteristics of pelvic binders. *Injury*. 2007;38(1):118–21. doi:10.1016/j.injury.2006.03.018
3. Nguyen P, Pokrzywa C, Figueroa J, Jocoy KA, Brandolino A, Karam BS, et al. Predictive factors for the application of pelvic binders in the prehospital setting. *Prehosp Emerg Care*. 2024;28(2):425–30. doi:10.1080/10903127.2023.2213316
4. Privalov M, Junge M, Jung MK, et al. Comparison of T-POD and SAM Pelvic Sling II and the influence of attachment level in the initial management of unstable pelvic type C injuries: a cadaveric study. *Int J Emerg Med*. 2024;17:34. doi:10.1186/s12245-024-00610-8
5. Teleflex. Arrow® T-POD™ Pelvic Stabilization Device [Internet]. 2024 [cited 2024 Sep 27]. Available from: <https://www.teleflex.com/usa/en/product-areas/arrow-trauma/arrow-t-pod-pelvic-stabilization-device/index.html>
6. Weaver, Michael & Heng, Marilyn. (2015). Orthopedic Approach to the Early Management of Pelvic Injuries. *Current Trauma Reports*. 1. 10.1007/s40719-014-0005-4.

7. Yoshihara H, Yoneoka D. Demographic epidemiology of unstable pelvic fracture in the United States from 2000 to 2009: trends and in-hospital mortality. J Trauma Acute Care Surg. 2014 Feb;76(2):380–5. doi:10.1097/TA.0b013e3182ab0cde

Definitions

Kelly clamps: a type of surgical instrument commonly used in various medical procedures. Kelly clamps have a long, straight, or curved design with serrated jaws that run halfway down the length of the tip, allowing for a firm grip. The locking mechanism at the handles keeps them securely closed when needed.

Most Responsible Physician (MRP): refers to the healthcare professional who has overall responsibility for a patient's medical care and treatment during their stay in a hospital or other healthcare setting. The MRP coordinates the patient's care, manages their treatment plan, and ensures that all necessary medical decisions are made in collaboration with other healthcare providers. Typically, the MRP is the physician who admits the patient, but responsibility may be transferred if care is handed over to another physician.

Radiolucent: refers to a material's ability to allow radiation, such as X-rays, to pass through it without being absorbed. This property makes radiolucent materials appear transparent or minimally visible on imaging scans like X-rays, MRIs, or CT scans, allowing clear visualization of underlying tissues or structures. In medical devices, radiolucency is important because it means the device does not interfere with diagnostic imaging.

Trauma Surgeon: is a medical doctor who specializes in the care and treatment of patients with traumatic injuries, often resulting from accidents, falls, violence, or other high-impact events. Trauma physicians typically work in emergency departments or trauma centers and are skilled in rapidly assessing, diagnosing, and stabilizing critically injured patients. They collaborate with surgical teams, emergency medical services, and other specialists to provide comprehensive care, from initial resuscitation to surgical intervention if needed.

Zap straps: versatile fasteners used to bundle or secure items together. Made from durable nylon, they consist of a flexible strip with a ratcheting mechanism at one end, allowing the strap to be tightened but not loosened unless cut. Commonly used in electrical work to organize cables, zap straps are also used in various applications where quick, secure fastening is needed.

Appendices

[Appendix A: T-POD](#)

[Appendix B: Flat Sheet](#)

[Appendix C: Application](#)

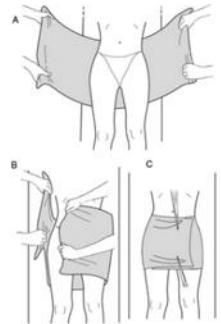
Appendix A: T-POD



Figure 1: Teleflex, 2024

Appendix B: Flat Sheet

Using clinical judgement and in collaboration with the MRP, may use TPOD or flat sheet.

Ideal Sheet Placement	Effective but less ideal
 Smooth flat sheet with metal clamps (Kelly clamps) on low pressure areas. Figure 2: <i>Orthopedic Approach to the Early Management of Pelvic Injuries, 2015.</i>	 Can use Zap straps or Kelly clamps on either side of the knot if CT is necessary. Figure 3: VGH Trauma Services

Appendix C: Application



T-POD centered at greater trochanter.



T-POD at iliac crest.



T-POD below the greater trochanter.

Figure 4: VGH
Trauma Services

First Released Date:	24-SEP-2025
Posted Date:	24-SEP-2025
Last Revised:	24-SEP-2025
Last Reviewed:	24-SEP-2025
Review due by:	24-SEP-2028
Approved By: <i>(committee or position)</i>	VCH VCH: (Regional DST Endorsement - 2 nd Reading) Health Authority & Area Specific Interprofessional Advisory Council Chairs (HA/AIAC) Operations Directors Professional Practice Directors Final Sign Off: Vice President, Professional Practice & Chief Clinical Information Officer, VCH
Owners: <i>(optional)</i>	Clinical Nurse Specialist, Emergency