Multi-Institutional Evaluation of the Current Management of Severe Traumatic Pelvic Fracture

Data Collection:

Demographic Data (All Mandatory) –
1. Age
2. Sex (Male/Female)
3. Date of Injury (mm-dd-yy)
4. Time of Injury (hh:mm)
5. Admission Date (mm-dd-yy)
6. Admission Time (hh:mm)

Mechanism of Injury (Choose One, Radio Buttons, Mandatory)
1. MVA
2. MCA
3. Pedestrian v. Auto
4. Bicycle accident
5. Fall
6. Assault
7. Other (blank text field)

Initial Assessment
1. Admission Vitals (All Mandatory)
   a. SBP
   b. HR
   c. GCS (menu to select from – 3-15 followed by Intubated check box) If GCS>11 and intubation checked need to have warning “GCS can not exceed 11 when patient intubated. Please correct.”
   d. Lowest recorded SBP within the first hour of arrival
2. Admission Labs
   a. pH
   b. Base deficit – have a check box of + or – and then the number
   c. Lactate
   d. Hct
   e. INR
   f. PTT
   g. ROTEM (have each individual parameter show up if checked off)
   h. TEG (have each individual parameter show up if checked off)
3. Pre-admission Anti-Coagulation/Anti-Platelet (choose all that apply, Radio buttons)
   a. Aspirin
   b. Plavix
   c. Coumadin
   d. Lovenox
   e. Subcutaneous Heparin
   f. Aggrenox
   g. Fragmin
   h. Prasugrel
   i. Pradaxa
   j. Other (blank text field)
If nothing is checked for this field the assumption is that the patient was not receiving any such agents and the default should be “None”.

**Injury Severity (All Mandatory)**
1. ISS – warning if ISS is outside range (0 – 75)
2. Highest Head AIS – warning if Head AIS is outside range (0 – 6)
3. Highest Chest AIS - warning if Chest AIS is outside range (0 – 6)
4. Highest Abdomen AIS (including pelvic contents) - warning if Abd AIS is outside range (0 – 6) – NOTE that the minimum AIS here should be 1 since they should have a pelvic fracture
5. Highest Extremity AIS (including pelvic skeleton) - warning if Extremity AIS is outside range (1 – 6) – NOTE that the minimum AIS here should be 1 since they should have a pelvic fracture

**Pelvic Fracture Type (Choose one, Mandatory)**
1. Closed
2. Open
   a. Packing of Open fracture in Trauma Bay/ED (yes/no, Mandatory if Open selected)

**Radiology**
1. Pelvis X-ray (yes/no, Mandatory)
2. CT scan (yes/no, Mandatory)
   a. CT angio (yes/no, Mandatory)
   b. Contrast extravasation (yes/no, Mandatory)
3. Pelvic Fracture Classification (choose all that apply, Radio Buttons)
   a. Anteroposterior Compression I
      i. <2.5cm Diastasis of pubic symphysis, no significant anterior or posterior ligamentous injury
   b. Anteroposterior Compression II
      i. >2.5cm Diastasis of pubic symphysis, disrupted anterior SI ligaments, intact posterior SI ligaments
   c. Anteroposterior Compression III
      i. Complete disruption of pubic symphysis, separation of hemipelvis, no vertical displacement, anterior and posterior ligaments ruptured
   d. Lateral Compression I
      i. Oblique pubic ramus fracture, no ligament disruption
   e. Lateral Compression II
      i. Oblique pubic ramus fracture with crush injury to sacrum, rupture of posterior sacroiliac ligament
   f. Lateral Compression III
      i. Oblique pubic ramus fracture with crush injury to sacrum, rupture of posterior sacroiliac ligament, contralateral anteroposterior (open book) injury
   g. Vertical Shear
      i. Vertical hemipelvis displacement, disruption of sacroiliac ligament, fracture through iliac wing or sacrum
**Method of Pelvic Bleeding Control**  (Mandatory, checkbox for each method of bleeding control (Bullets). If checkbox is selected options under that heading are revealed. Can pick more than one checkbox.)

- **Pelvic Binder? (yes/no)**
  a. Did patient arrive with pelvic binder in place? (yes/no)
  b. If no, was pelvic binder applied in the ED/trauma bay?

- **Angiographic Embolization of Pelvis**
  1. Angiogram (yes/no, Mandatory)
     a. Date of angio (mm-dd-yy, Mandatory)
     b. Time of angio (hh:mm, Mandatory)

If Angiogram=Yes then questions 2-6 should show up, if Angiogram=No then these questions don’t show up and their default is “N/A”

  2. Indication for Angiogram (choose all that apply, Mandatory if Yes to Angiogram)
     a. Blush/Extravasation on CT (yes/no)
     b. Large Pelvic Hematoma (yes/no)
     c. Fracture Pattern (yes/no)
     d. Hemodynamic Instability (yes/no)
     e. Ongoing Hemorrhage/Need for Blood Transfusion

  3. Presence of contrast extravasation on angiogram (yes/no, Mandatory if Yes to Angiogram)

  4. Therapeutic angioembolization (yes/no, Mandatory if Yes to Angiogram)

  5. What agent was used for angioembolization (Mandatory if Yes to Angiogram, can check more than one)
     a. Coils
     b. Plug
     c. Gelfoam
     d. More than one
     e. Other

  6. Did angioembolization definitively control the source of pelvic hemorrhage (yes/no/unsure, Mandatory if Yes to angiogram)?

  7. Was additional pelvic angiogram performed during the index hospitalization?
     a. Date of angio (mm-dd-yy, Mandatory)
     b. Time of angio (hh:mm, Mandatory)
     c. Was angioembolization performed?

- **Placement of Pelvic Fixator**
  1. Use of External Pelvic Fixation (yes/no, Mandatory)

If Pelvic Fixator=Yes then questions 2-3 should show up, if Pelvic Fixator=No then these questions don’t show up and their default is “N/A”

  2. Time to Pelvic Fixation (Mandatory if Yes to External Pelvic Fixator)
     a. Date (mm-dd-yy)
     b. Time (hh:mm)
3. Did external fixation definitively control the source of pelvic hemorrhage (yes/no, Mandatory if yes to External Pelvic Fixator).

- **Pre-Peritoneal Pelvic Packing In OR: should only be for patients who had intra-operative pre-peritoneal packing – not just packing an open wound.**
  1. Use of pre-peritoneal pelvic packing (yes/no, Mandatory)

Again, questions 2-4 show up if Pre-peritoneal Packing=Yes, otherwise they don’t show up and default=N/A

2. Time to OR (Mandatory if Yes to Pre-peritoneal pelvic packing)
   a. Date (mm-dd-yy)
   b. Time (hh:mm)

3. When were packs removed?
   a. Date (mm-dd-yy)
   b. Time (hh:mm)

4. Did pre-peritoneal pelvic packing definitively control the sources of hemorrhage (yes/no, Mandatory if Yes to Pre-peritoneal pelvic packing)

- **Intra-arterial Balloon Occlusion Device (REBOA)**
  1. Use of Intra-arterial balloon occlusion device (yes/no)

Again, if question 1 is answered Yes then 2-3 below show up, otherwise default =N/A

2. Time to occlusion device placement (Mandatory if Yes to occlusion device)
   a. Date (mm-dd-yy)
   b. Time (hh:mm)

5. Level of occlusion device placement?
   a. Zone 1
   b. Zone 2
   c. Zone 3

6. Occlusion type?
   a. Partial
   b. Complete
   c. Unsure

7. SBP prior to balloon occlusion

8. Time of balloon deflation
   a. Date (mm-dd-yy)
   b. Time (hh:mm)

9. Why was REBOA performed (mandatory)?
   a. As a temporizing measure to other method of hemostasis
   b. As sole method of hemostasis
   c. After failure of other method of hemostasis (pre-peritoneal packing, angioembolization, iliac artery ligation, and/or ex-fix)

10. Did REBOA definitively control the source of pelvic hemorrhage (yes/no, Mandatory if Yes to REBOA)?

- **Internal Iliac Artery Ligation**
  1. Was internal iliac ligation performed?
  2. Time to procedure (mandatory)
     1. Date (mm-dd-yy)
     2. Time (hh:mm)
3. Did internal iliac artery ligation definitively control the source of pelvic hemorrhage (yes/no, Mandatory if Yes to internal iliac artery ligation)?

- How was the pelvis definitively identified as a source of hemorrhage (mandatory, pick one)?
  a. CT angiography
  b. Intra-operative findings
  c. Diagnostic angiography
  d. Other
- If other, please state:

**Hospital Course**

1. Was definitive fixation of pelvic fracture performed (mandatory)?
   a. Time to Definitive Fixation of Pelvic Fracture
      i. Date (mm-dd-yy)
      ii. Time (hh:mm)

2. Additional operative interventions for hemorrhage control (mandatory)?
   a. None
   b. Laparotomy
      i. Date/time
      ii. What procedures were performed? Check off
         1. Liver packing/hepatorrhaphy
         2. Splenectomy
         3. Nephrectomy
         4. Major vessel repair/ligation
   c. Thoracotomy or sternotomy
      i. Date/time
      ii. What procedures were performed?
         1. Lung resection/tractotomy
         2. Cardiac repair
         3. Major vessel repair/ligation
   d. Extremity hemorrhage control
      i. Date/time
      ii. What procedures were performed?
         1. Arterial repair/ligation/shunt placement
         2. Venous repair/ligation/shunt placement
         3. Long bone repair
         4. Amputation
   e. Angioembolization (not including pelvic AE)
      i. Date/time
      ii. What procedures were performed?
         1. Splenic
         2. Hepatic
         3. Angioembolization of other/retroperitoneal vessels (lumbar, intercostal)

3. Any neurosurgical interventions performed?
a. EVD
b. ICP monitor
c. Craniectomy/craniotomy

4. Ventilator Days (Mandatory)
5. ICU LOS (Mandatory)
6. Hospital LOS (Mandatory)
7. Transfusion requirements
   a. In first 6 hours
      i. pRBC
      ii. Platelets
      iii. FFP
      iv. Whole blood units
   b. In first 24 hours
      i. pRBC
      ii. Platelets
      iii. FFP
      iv. Whole blood units
8. Any hemostatic agents administered in the first 6 hours? (check off)
   a. Prothrombin Complex Concentrate
   b. Tranexamic acid
   c. Cryoprecipitate
   d. Riastap (fibrinogen concentrate)
9. Stable hct x 2
   a. Date
   b. Time
10. Complications
    a. Acute renal failure
        i. If yes, was dialysis required?
    b. Ventilator Dependent Resp Failure
        i. If yes, was tracheostomy required?
    c. Sepsis
    d. Lower extremity ischemia
        i. If yes, was amputation required?
    e. Femoral artery dissection and/or pseudoaneurysm
        i. If yes, was intervention required?
    f. Gluteal necrosis
        i. If yes, was intervention required?
    g. Bladder injury
        i. If yes, was repair required?
    h. Iliac/femoral vein DVT?
11. Discharge Disposition (Mandatory, Radio Buttons, Select One)
    a. Home
    b. Acute Care facility
    c. Skilled nursing facility
    d. Rehabilitation facility
    e. Jail/Prison
f. Morgue
g. Other (blank text field)

12. In-hospital Mortality (yes/no, Mandatory)
   If yes,
   a. Date of death
   b. What was the time of death? HH:MM
   c. Location of death
      i. ED/trauma bay
      ii. Operating room
      iii. ICU
      iv. Ward
   d. Did ongoing pelvic bleeding contribute to the death (yes/no)?
   e. What was the cause of death based on your chart review/knowledge of the case?
      i. Pelvic hemorrhage
      ii. Hemorrhage at other location
      iii. TBI
      iv. Sepsis
      v. Multifactorial
      vi. Other ____________________