

Priorities in Management for Unstable Patients with Pelvic Fractures

Lenworth M. Jacobs, MD, MPH, FACS

Director Trauma Institute

Hartford Hospital

Professor of Surgery

University of Connecticut

MANAGEMENT OF PERINEAL AND PELVIC INJURIES

Lenworth M. Jacobs, MD, MPH, FACS

Director, Trauma Institute

Hartford Hospital

Professor of Surgery

University of Connecticut

OPEN PELVIC FRACTURES

DEFINITION

**Direct communication
between pelvic fracture and
vagina, perineum
or groin**

RESUSCITATION PRIORITIES

- **Evaluate entire patient**
- **Airway and ventilation**
- **Hemorrhage control**

PELVIC FRACTURES

Key and Conwell Classification

Kane Modification - Anatomic

- | | |
|-----------------|--|
| Type I | Breaks not involving the pelvic ring |
| Type II | Single breaks, non-displaced |
| Type III | Double breaks <ul style="list-style-type: none">a) Malgaineb) Straddle Fracturec) Severe Multiple or crushing fractures |
| Type IV | Acetabular Fractures <ul style="list-style-type: none">a) Rim fractureb) Centralc) Ischio-acetabular |

PELVIC FRACTURES

Bucholz Classification

Stability

- Type I* Mildly displaced anterior fracture
Non-displaced sacral fracture
Mild disruption of S-I ligaments
- Type II* Open book - hemi-pelvis
Externally rotated
- Type III* Total disruption S-I joint
Tri-plane displacement hemi-pelvis
Cephalad, Posterior and External Rotation

ANALYSIS OF PELVIC FRACTURE MANAGEMENT

- 533 patients/5 years
- 6.4% overall mortality
- 18% mortality in group III Kane
- Hemodynamically stable: 3.4% mortality
- Hemodynamically unstable: 42% mortality
- Pelvic fracture major cause of death in 12%
 - Contributing role in 53% deaths
 - No role in 35% deaths

PELVIC FRACTURES

- **Stable**
 - **Anatomically**
 - **Hemodynamically**
- **Unstable**
 - **Identify location**
 - **Control hemorrhage**

DILEMMAS WITH COMBINED SEVERE ABDOMINAL-PELVIC INJURIES

Rapid diagnosis of

- Intra-peritoneal hemorrhage**
- Retro-peritoneal hemorrhage**
- Pelvic hemorrhage**
- Extent of soft tissue injury**

PELVIC HEMORRHAGE

Venous 70%: Restore Normal Anatomy

Arterioles: Pelvic Compression

Major Arteries: Embolise or Surgical Control

PELVIC HEMORRHAGE

Control Bleeding Vessel

- **External Pressure**

 - Pelvic Wrap**

 - C-Clamp**

- **Internal**

 - Embolization**

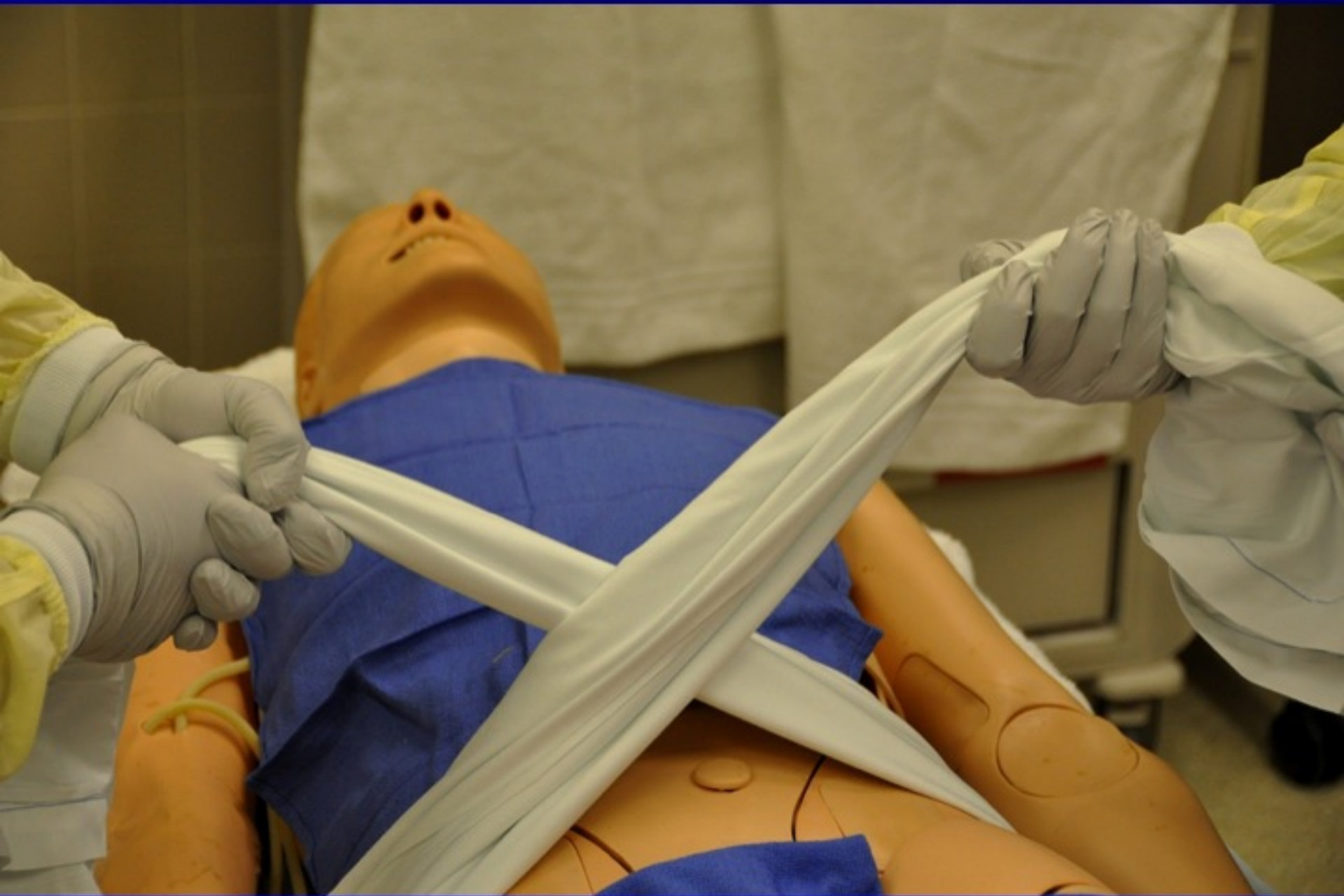
 - Operative Management**

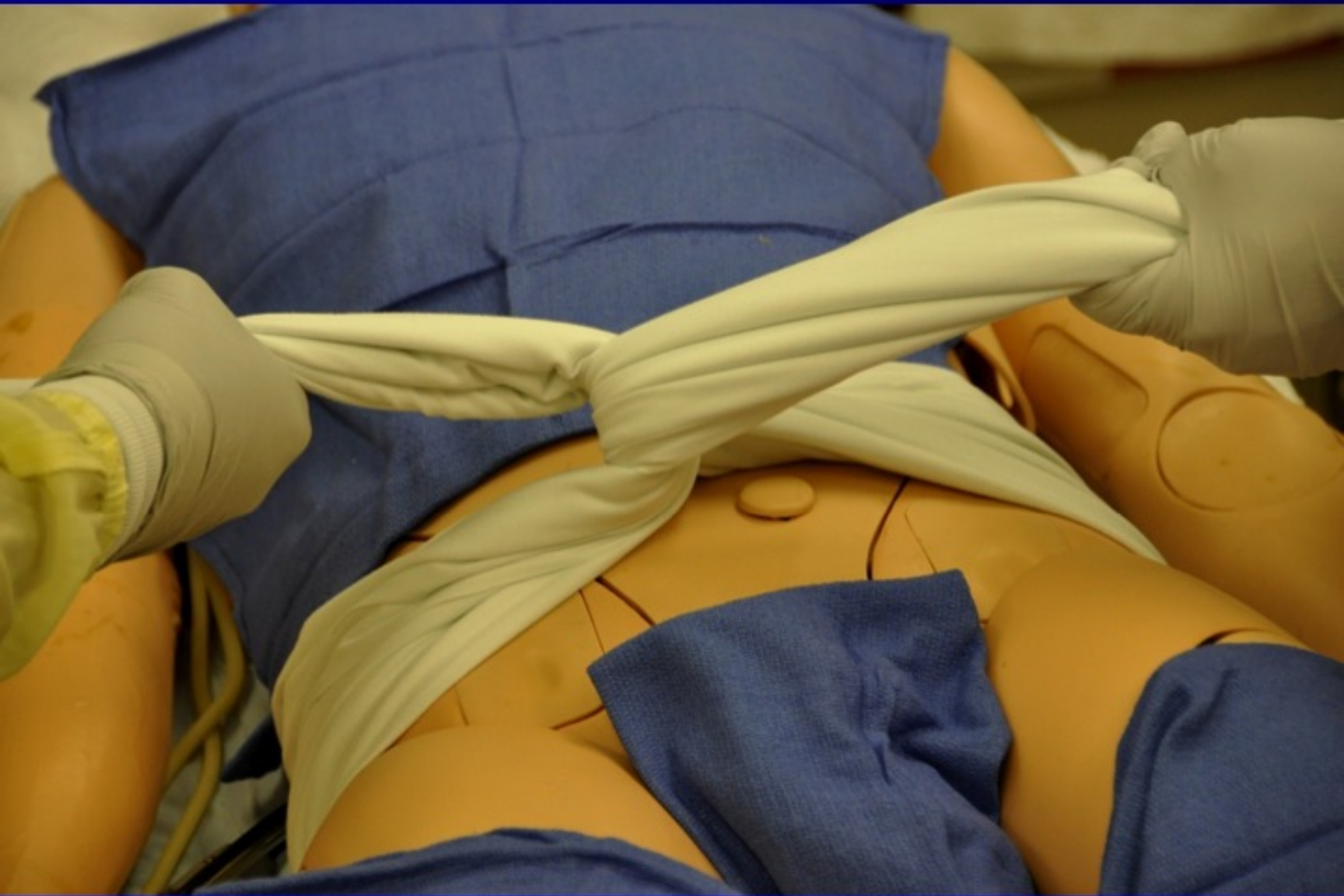
EXTERNAL FIXATION DEVICES

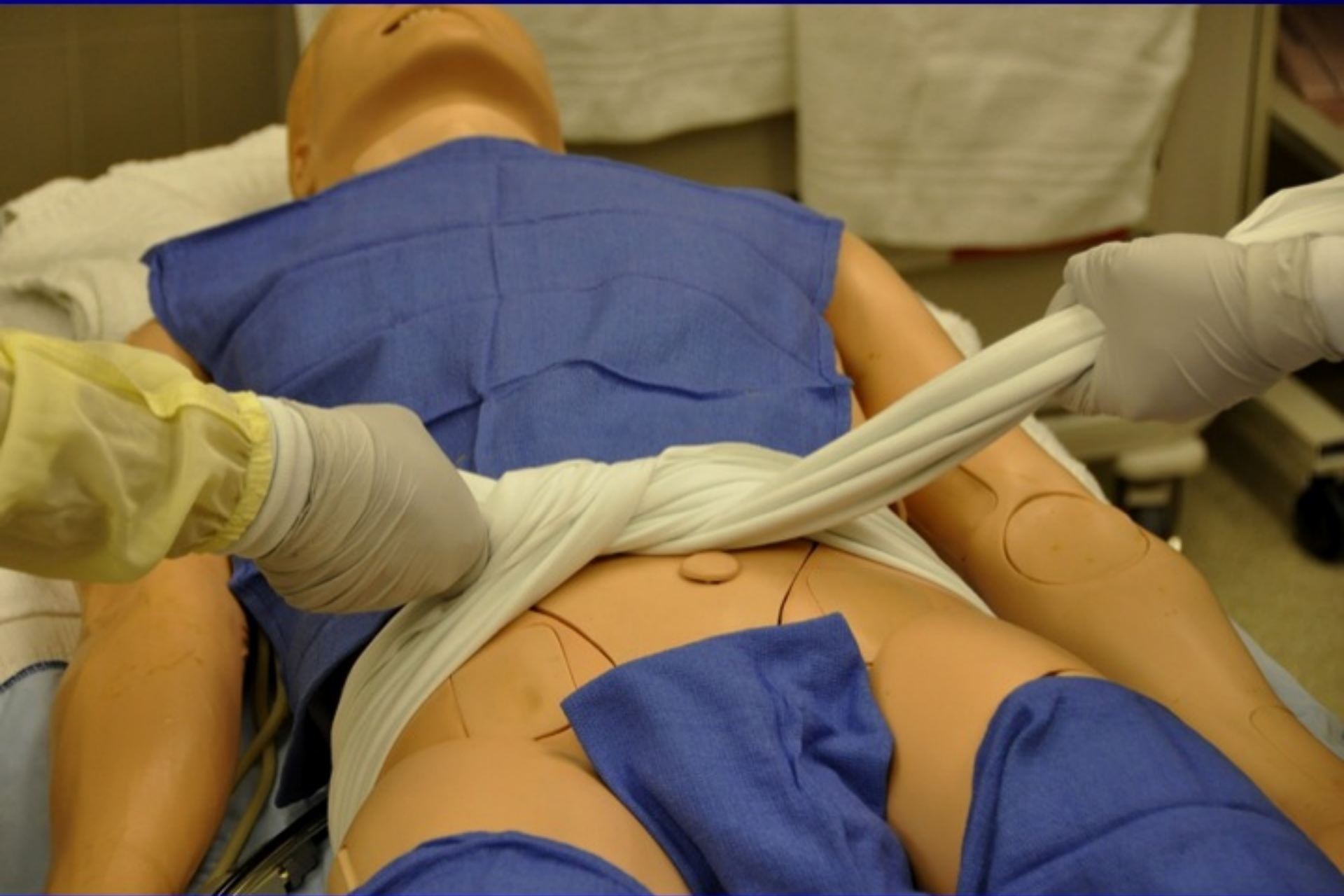
**Return Pelvis to normal
Anatomic Position**

Pelvic Wrap - Sheet

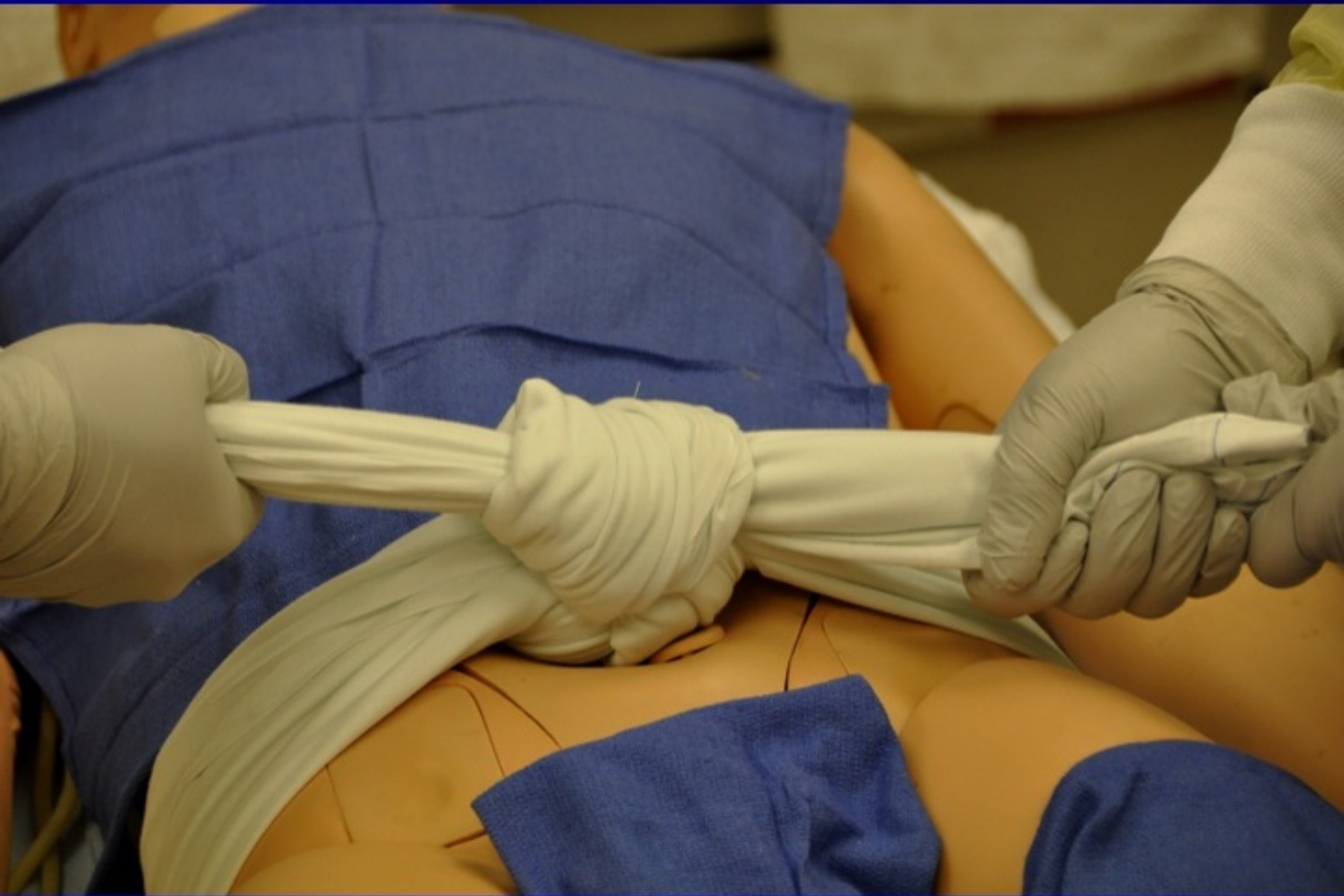










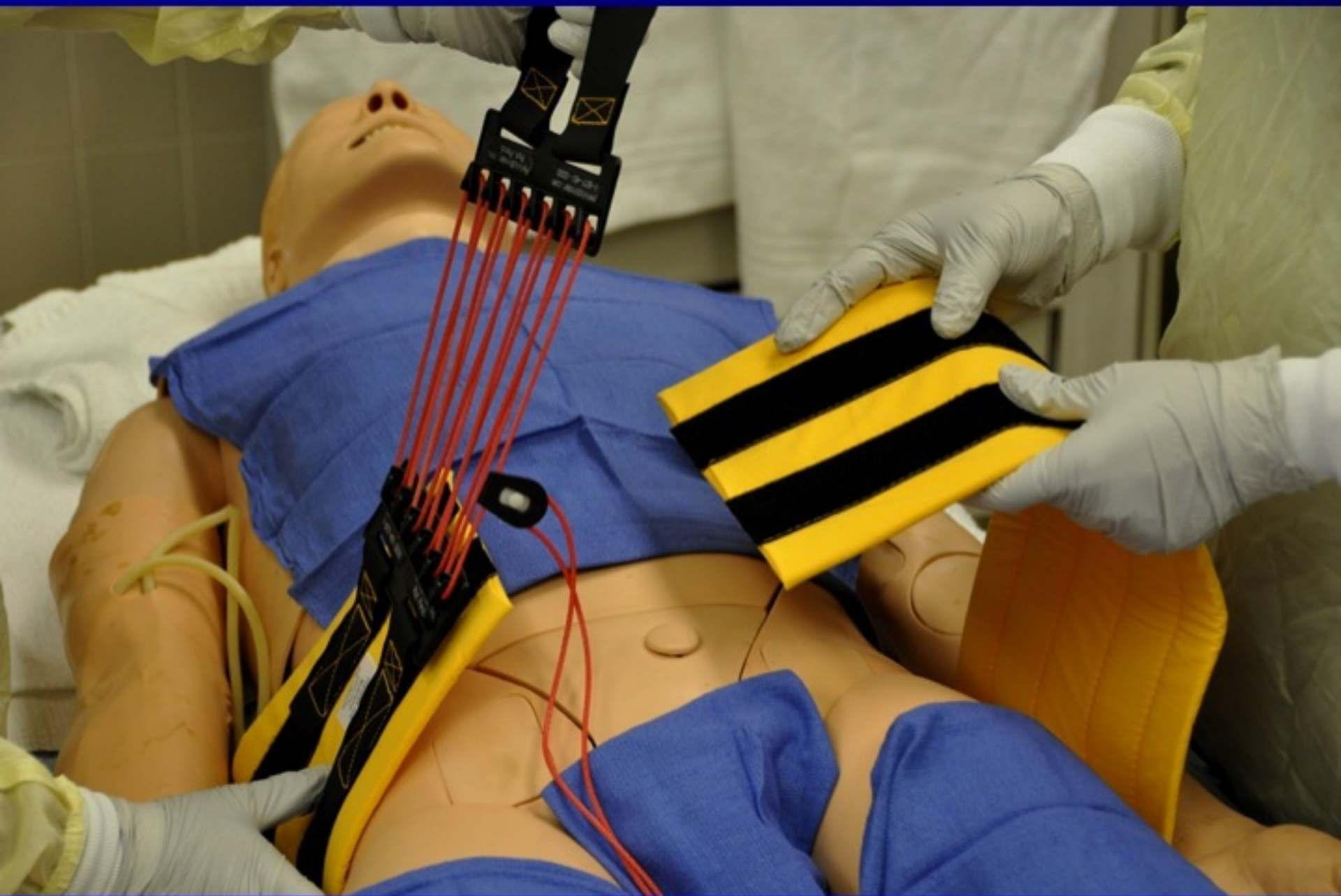


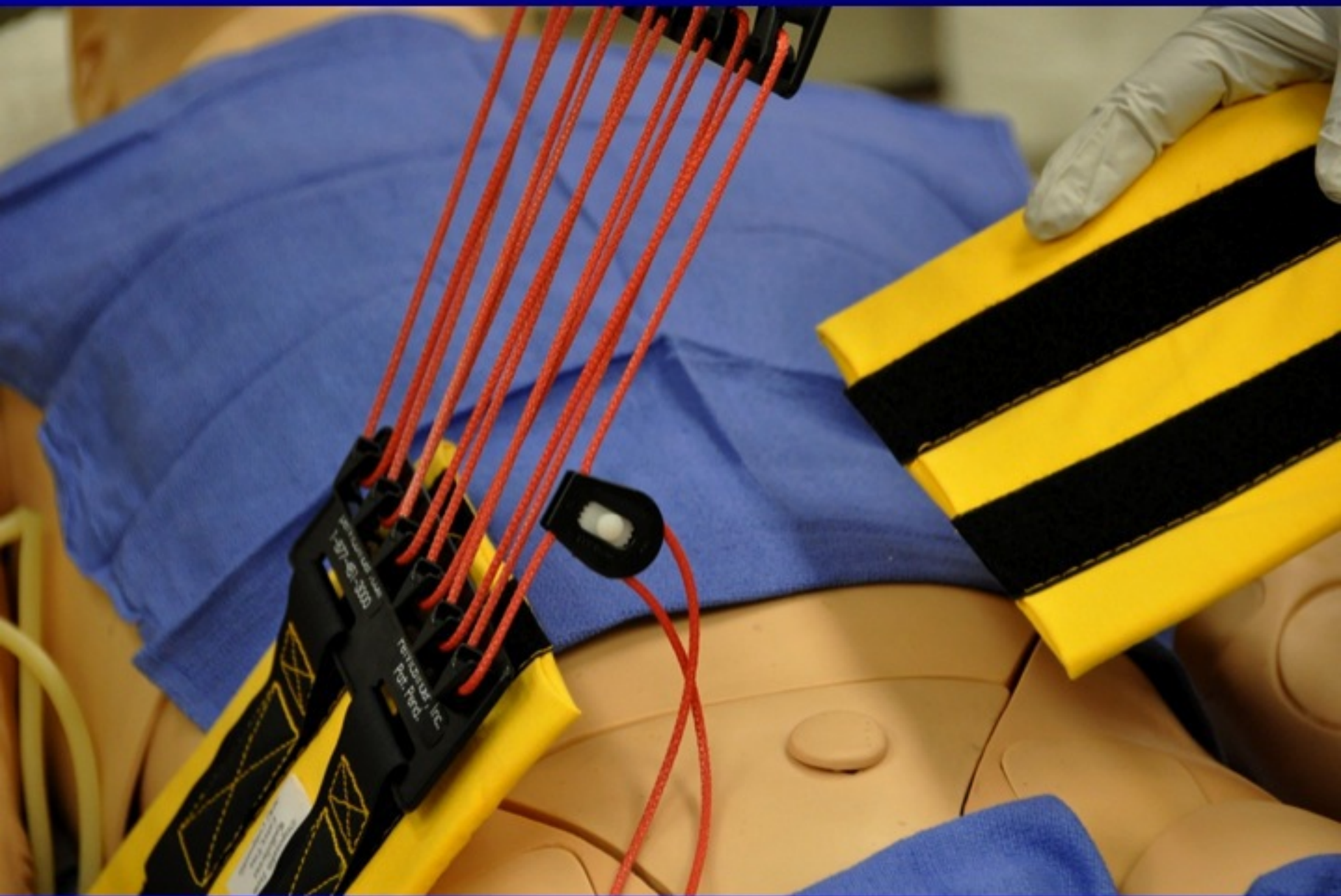
EXTERNAL FIXATION DEVICES

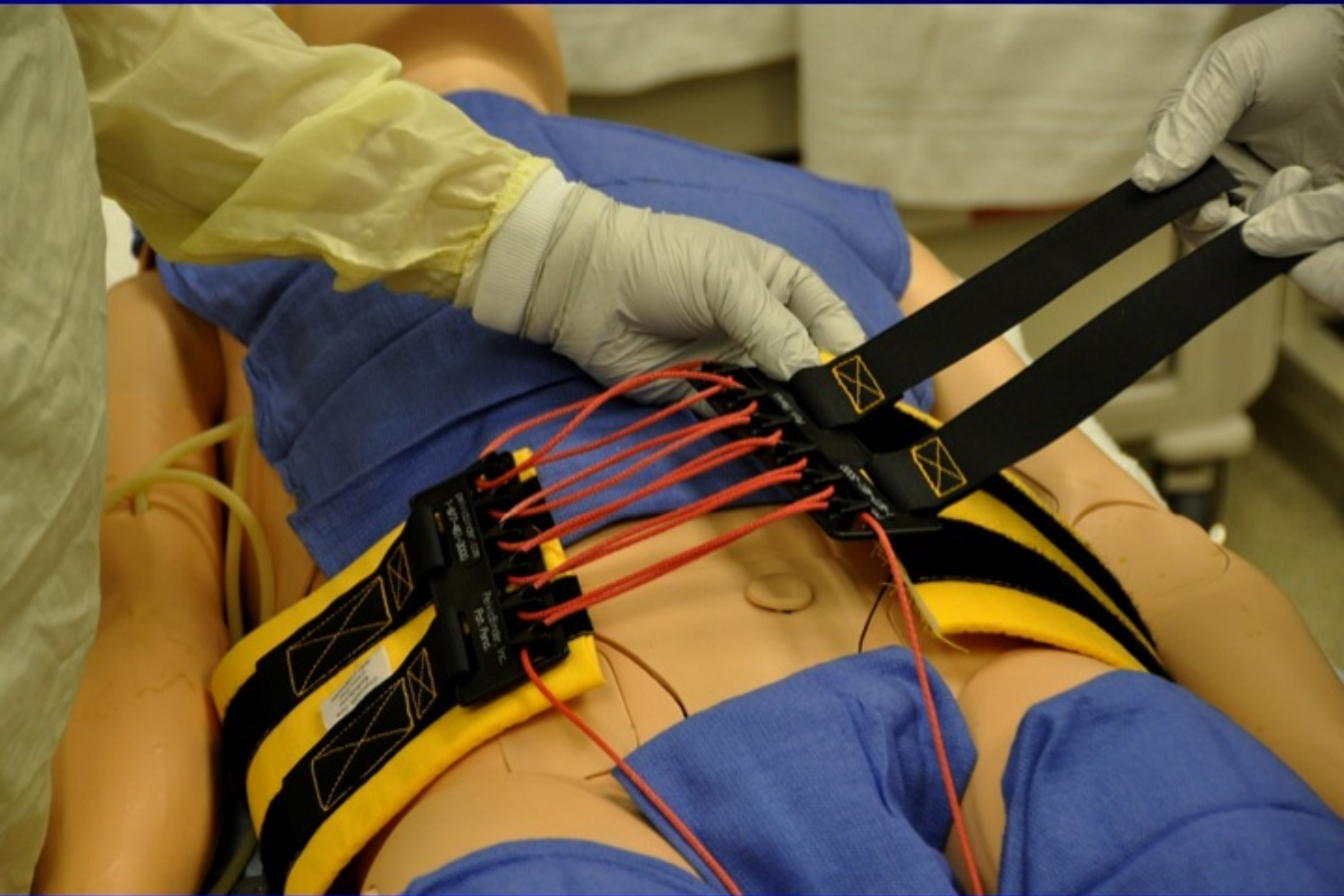
**Return Pelvis to normal
Anatomic Position**

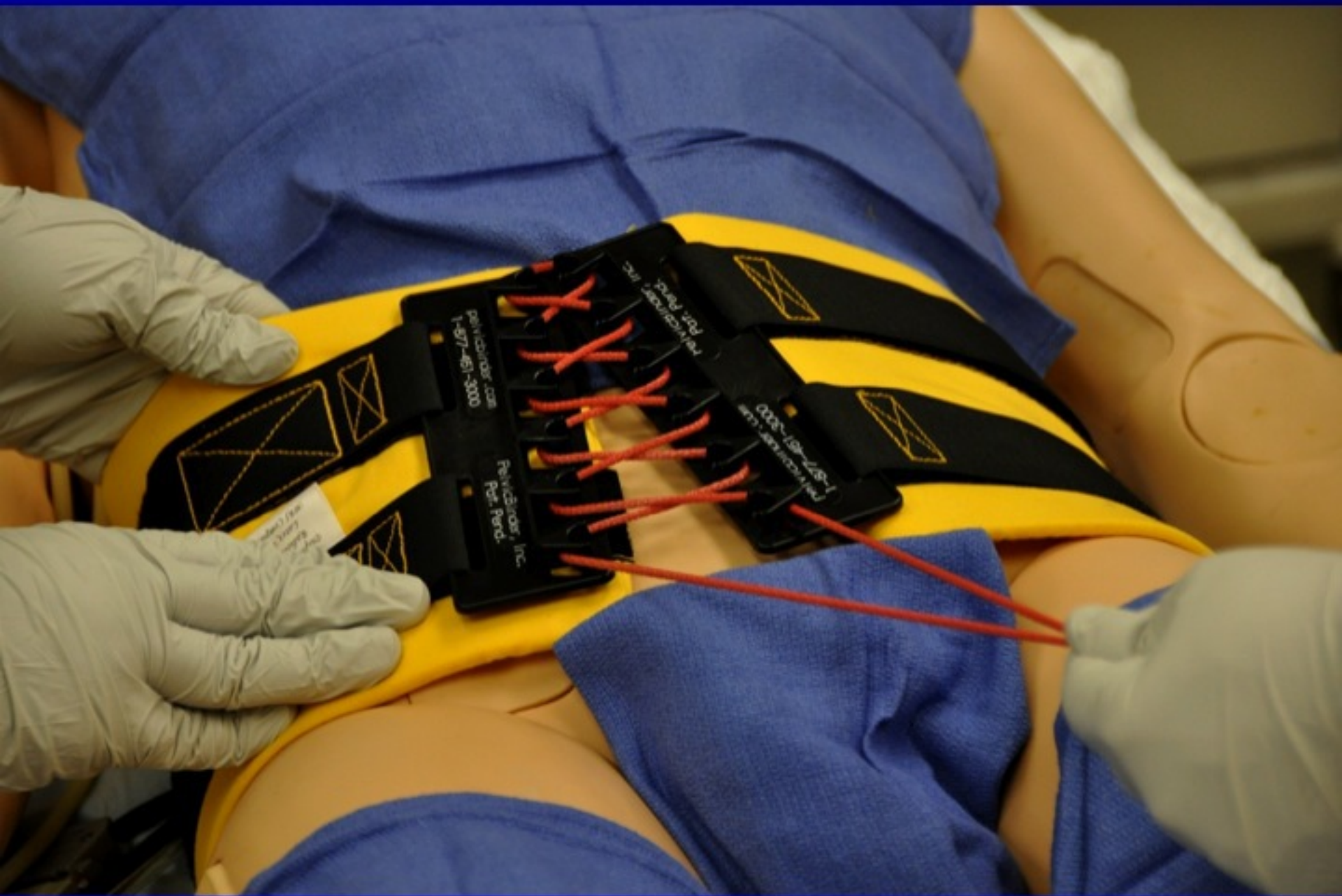
Pelvic Binder

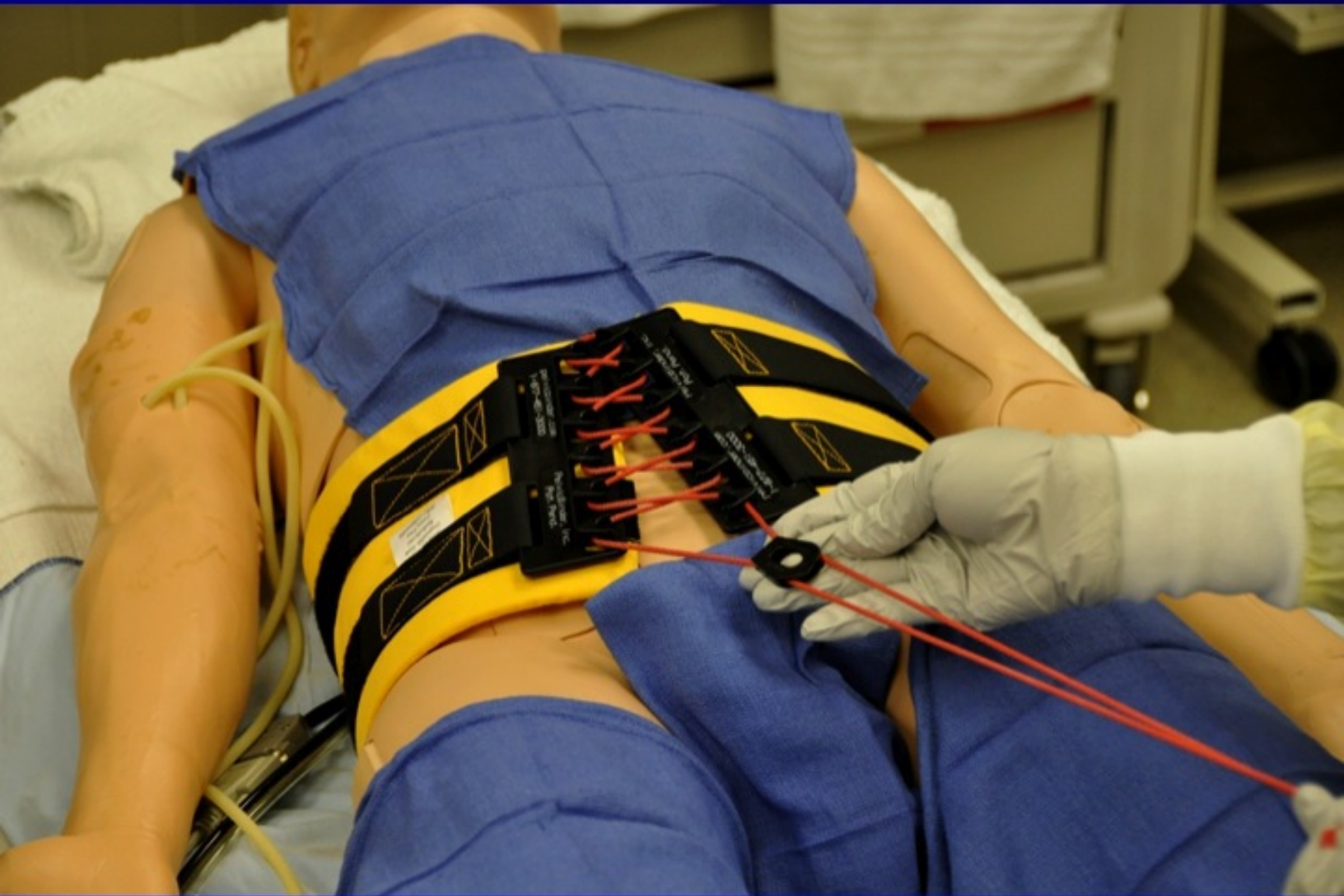












EXTERNAL FIXATION DEVICES

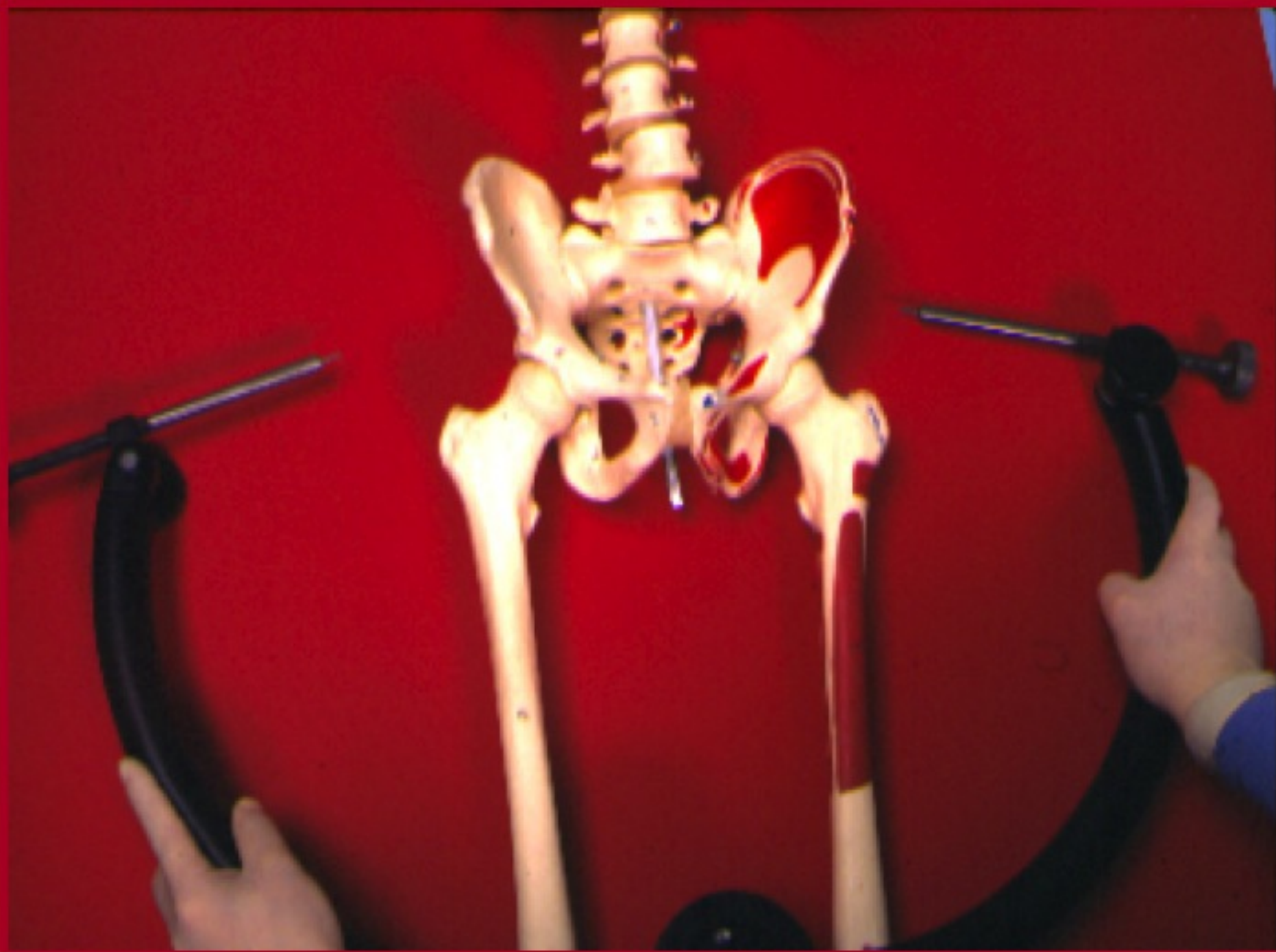
**Return Pelvis to normal
Anatomic Position**

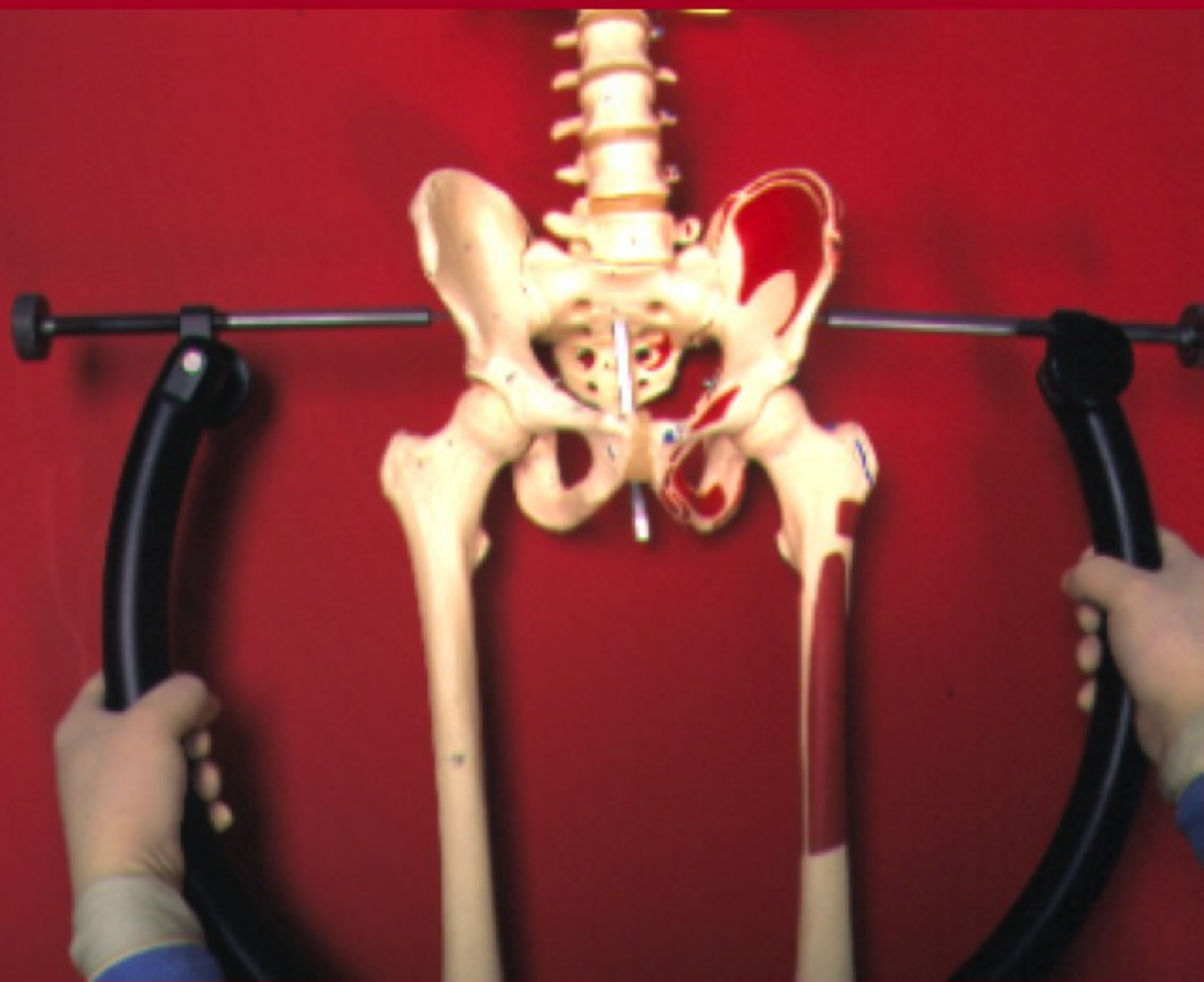
C-Clamp









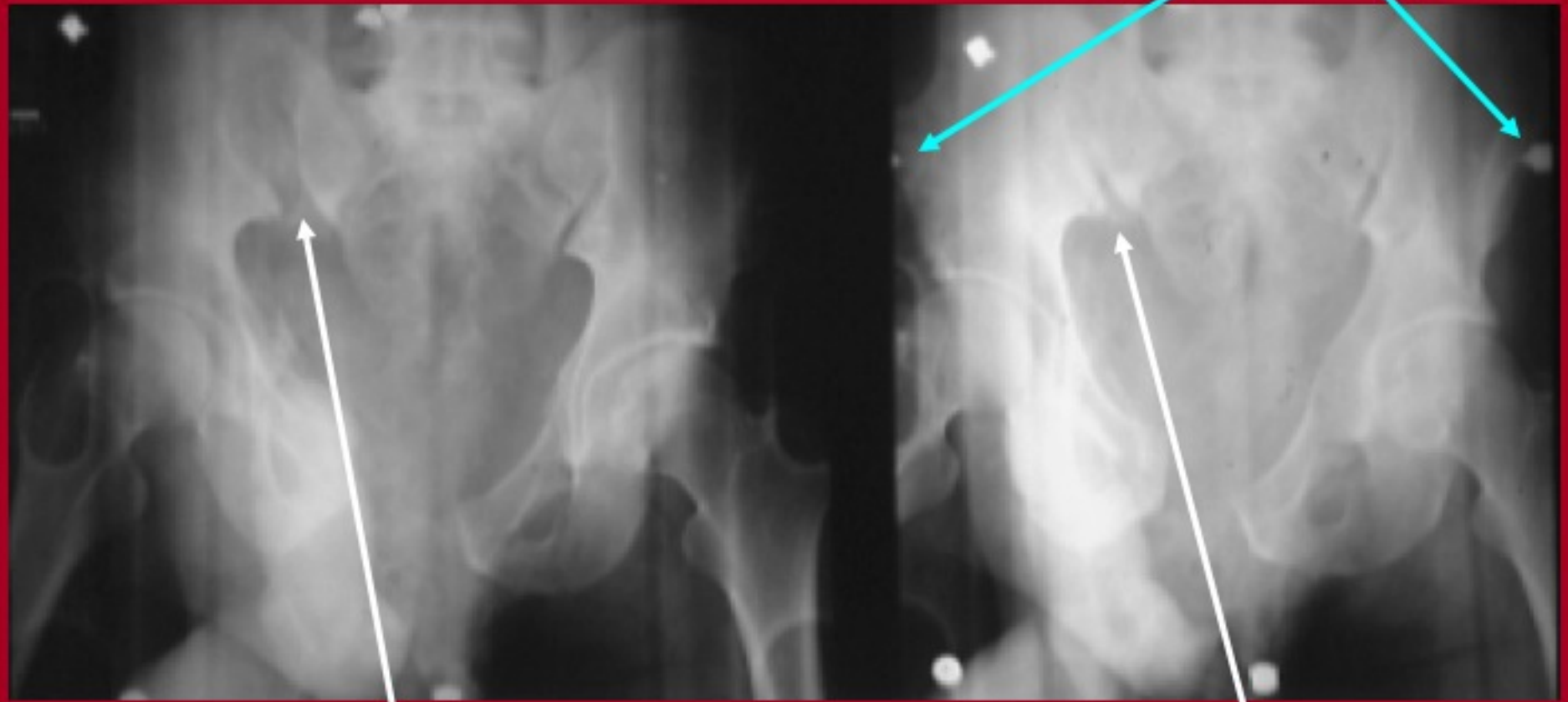






PRE-C CLAMP

POST-C CLAMP



S-I JOINT OPEN

S-I JOINT CLOSED

CT SCANS IN PELVIC TRAUMA

- **Defines anatomy**
- **Specific and sensitive**
- **Defines intra-pelvic pathology**
- **Defines intra-peritoneal pathology**
- **Quantifies hemorrhage**

CT SCAN IN PELVIC TRAUMA

- Requires stable patient**
- Remote environment**
- Delays definitive care**



Im:42 +C

DFOV 34.0cm

STND/P

016

R
1
7
8

L
1
6
3

R

L

kV 120

mA 200

Large

5.0mm

1000 0.0



140V 34.0cm
CTNO/P

R 178

L 163

R

L

kV 120
mA 200
Large
5.0mm



:30512

#130

12%

e:2

C 1231.0

n:50

FOV 38.0cm

ONE

D

L



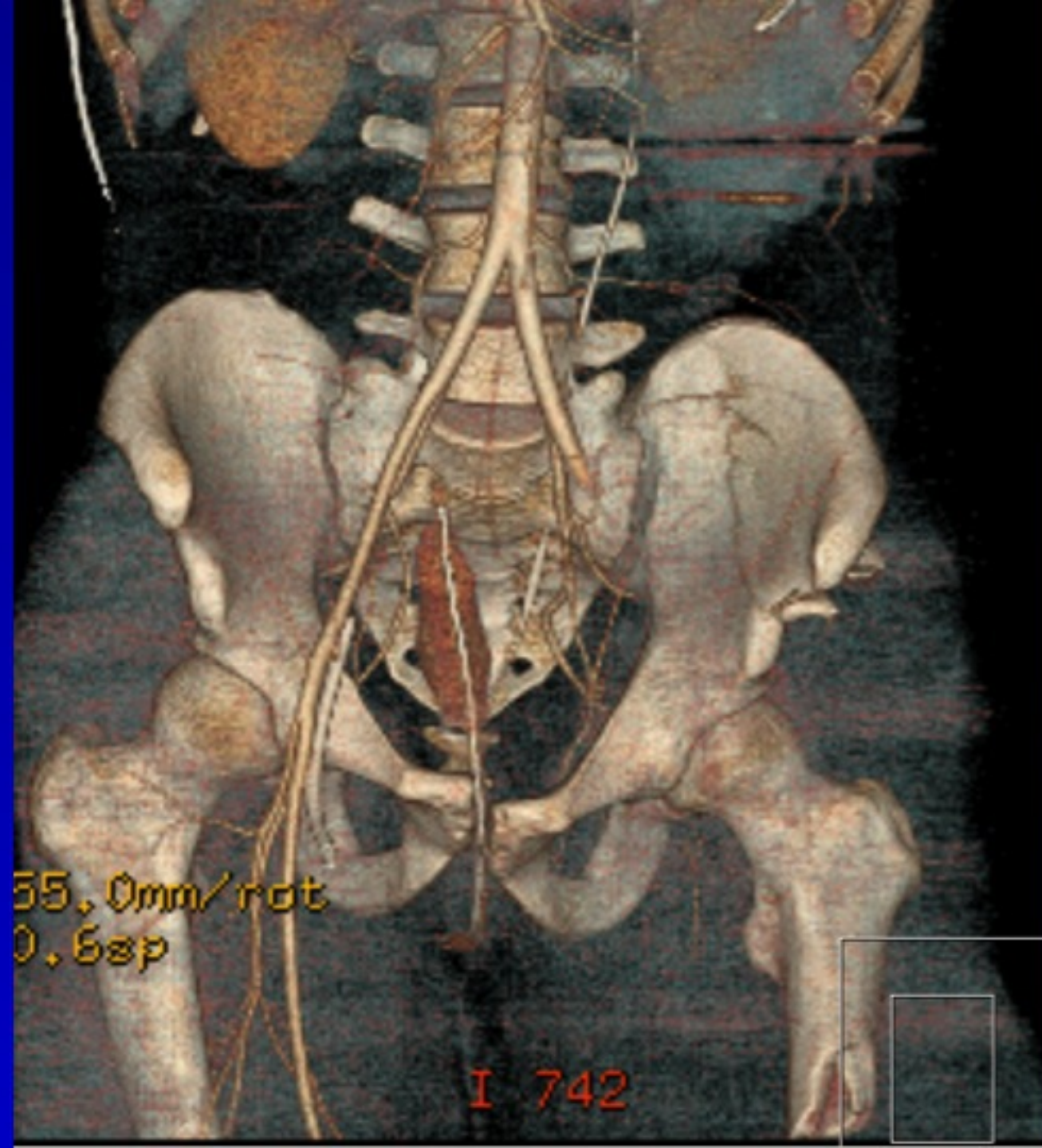
History

25 y/o male helmeted MCC

Combative in field, intubated by EMS

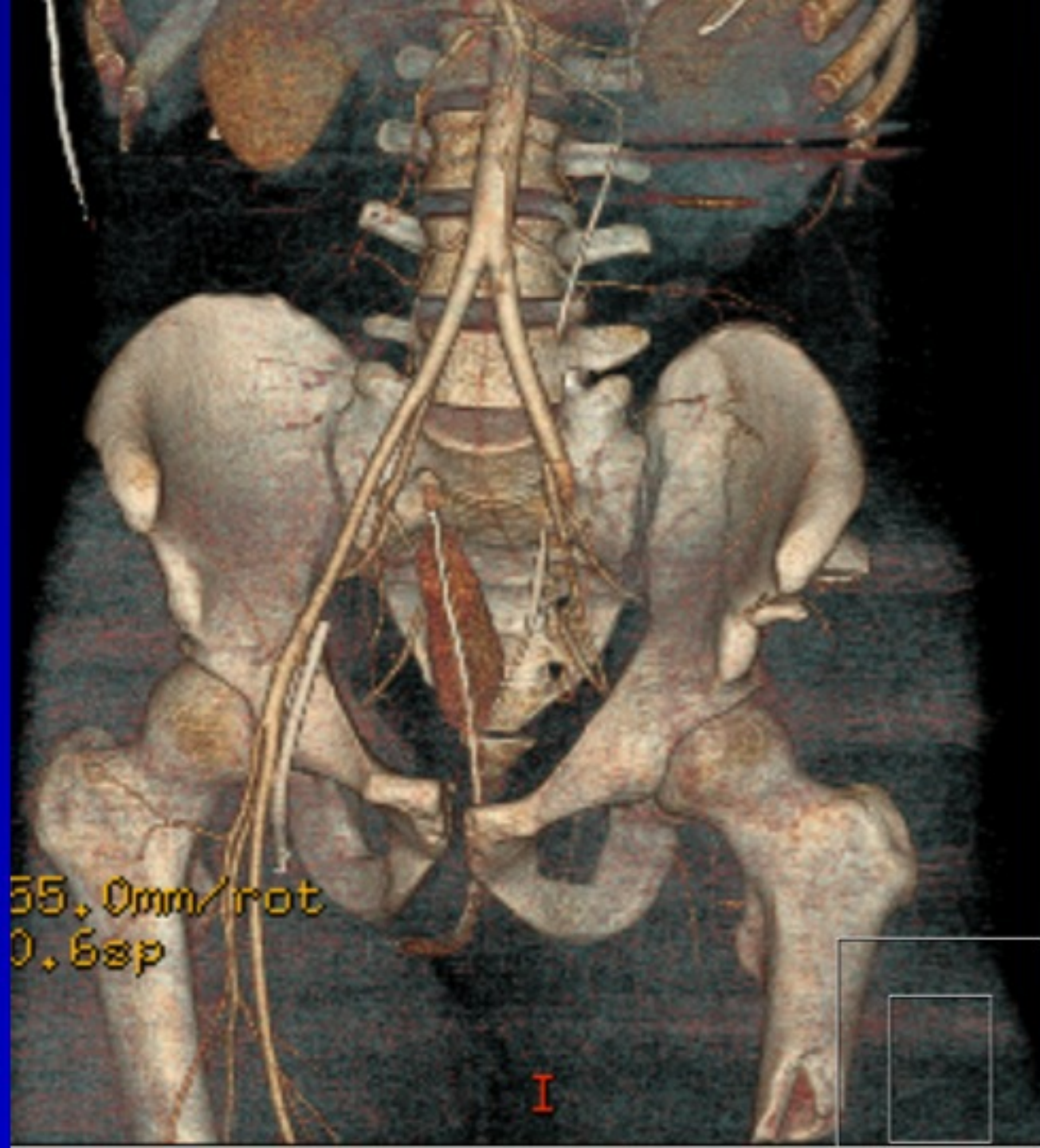
Hypotensive in trauma bay

**Deformed Left thigh, Left inguinal
hematoma, Open Left tibial fracture**



55.0mm/rot
0.6sp

I 742



55.0mm/rot
0.6sp

I

Surface 19
Ex: 48874
Se: 4 +c
Volume Rendering No cut

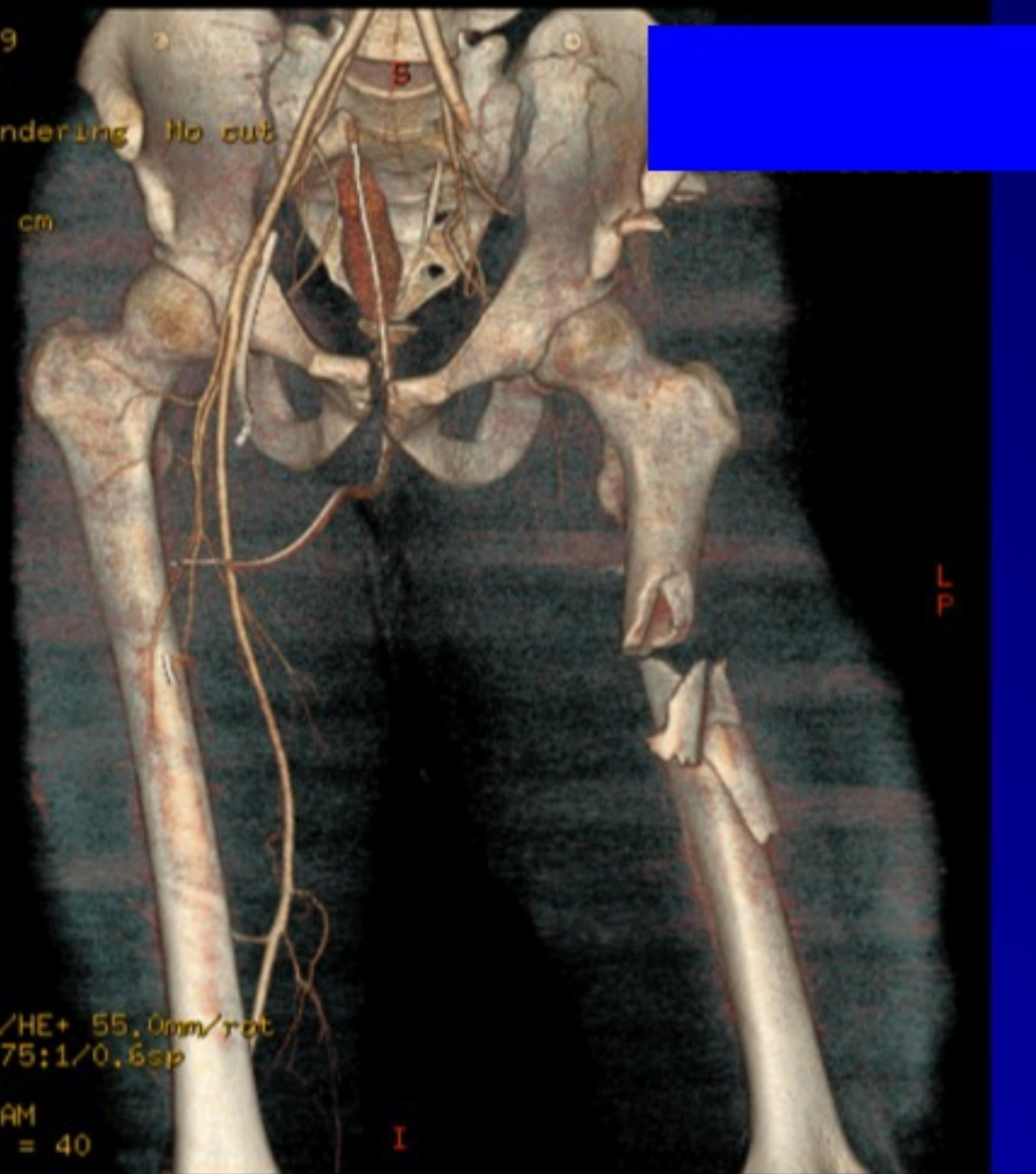
DFOV 52.0 cm
STND
455/19

R
A

L
P

No VOI
kv 100
mA Mod.
Rot 0.40s/HE+ 55.0mm/rot
0.6mm 1.375:1/0.6sp
Tilt: 0.0
09:20:15 AM
W = 400 L = 40

I



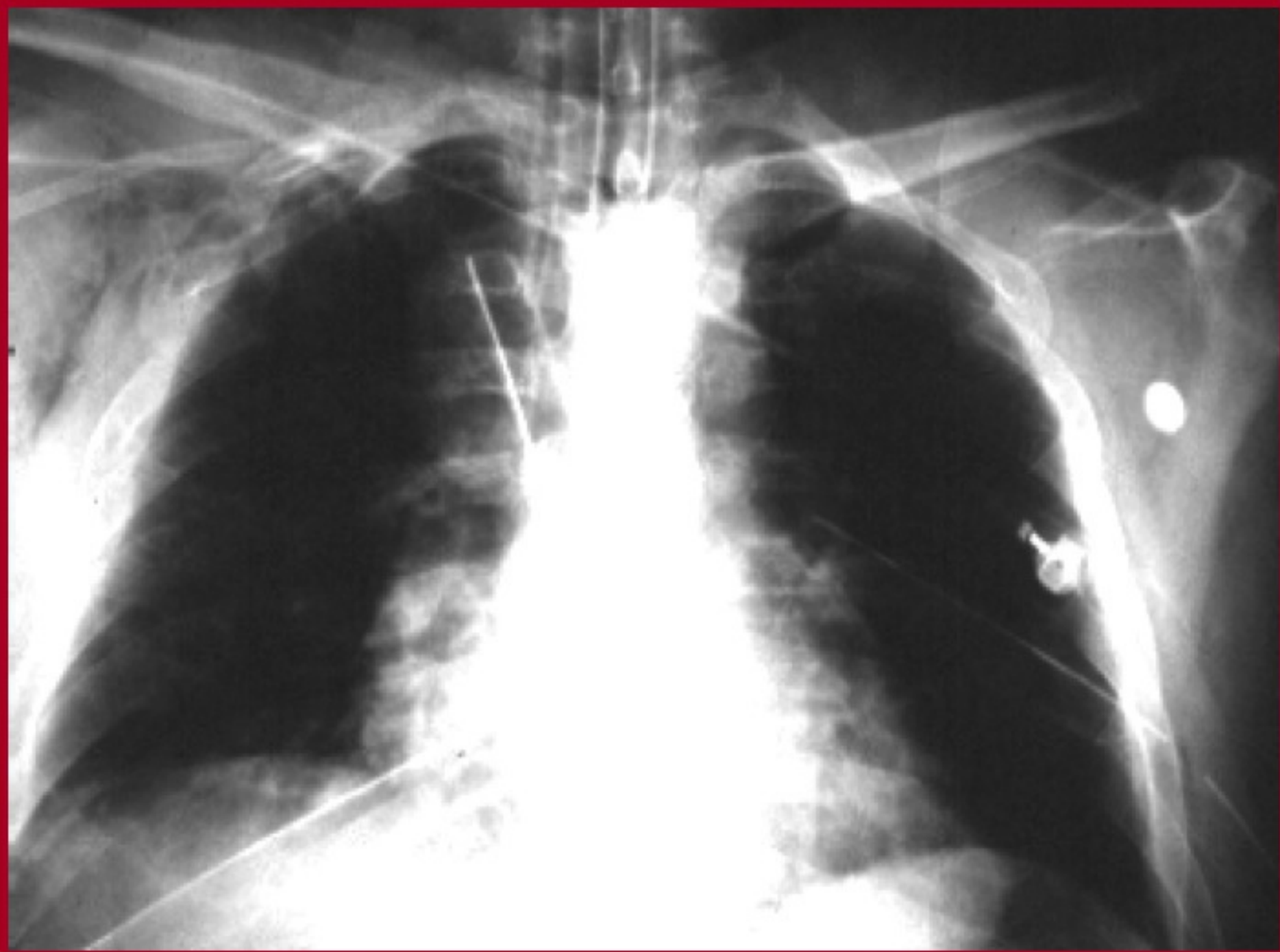
ROLE OF ANGIOGRAPHY

Delineate source of hemorrhage

**Evaluation of Major Vascular
Structures and abdominal
organs**

Therapeutic Embolisation





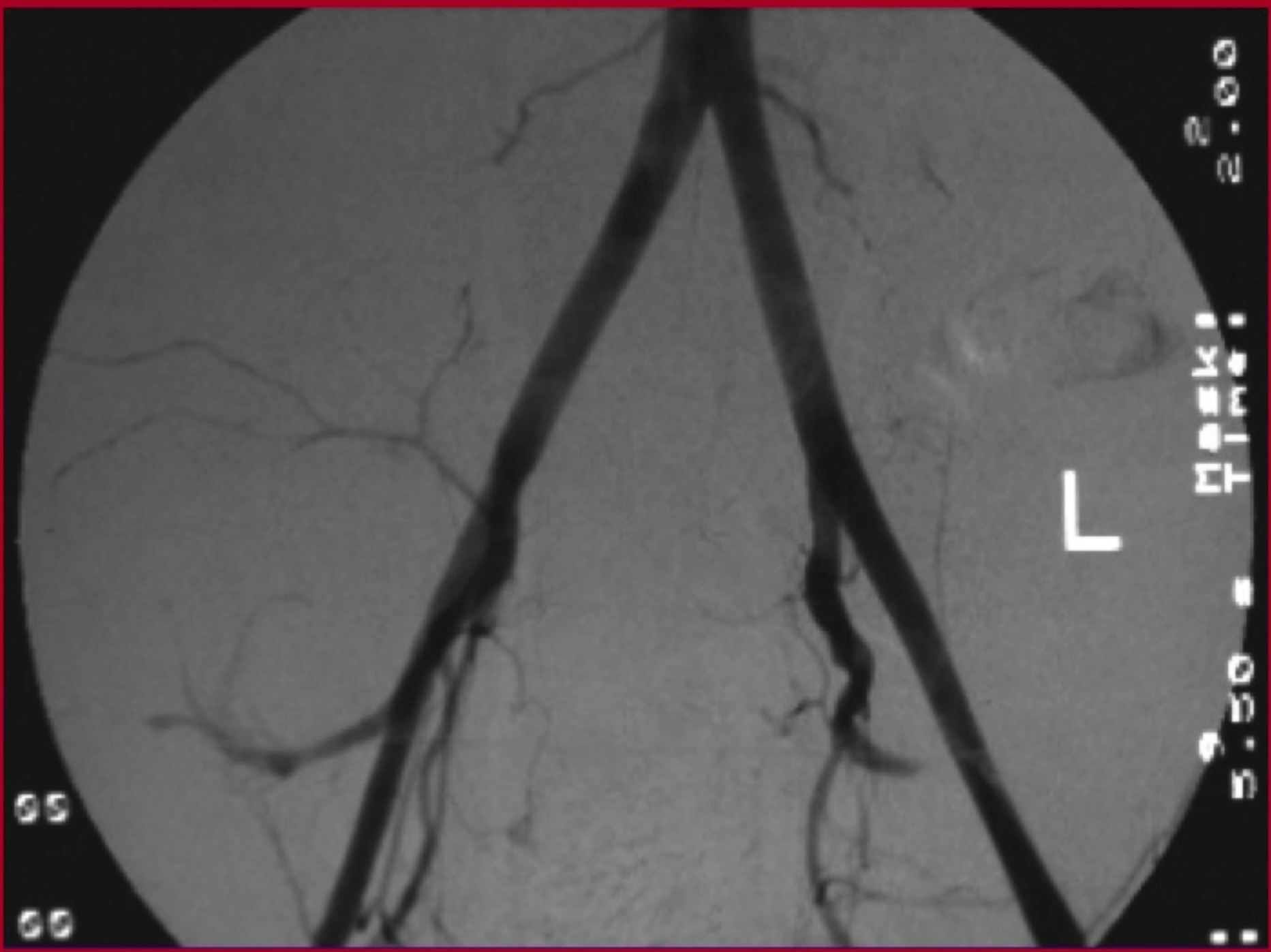
99



00:00

10:11

00:00



05

00

2.00

Hrsk

5.50

:

05

05

L
POST
EMBOLIZATION

Mask
Time

3:50
3:50

10:50

1