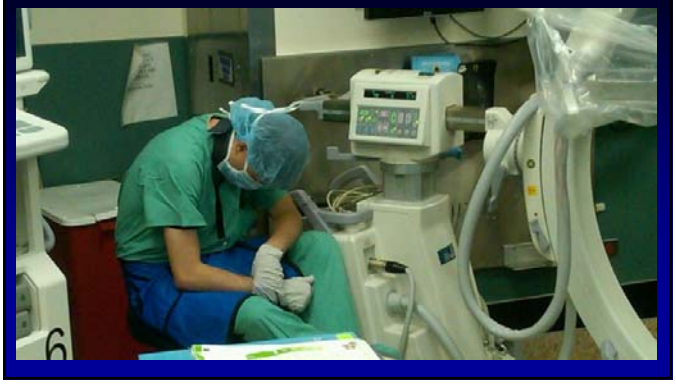
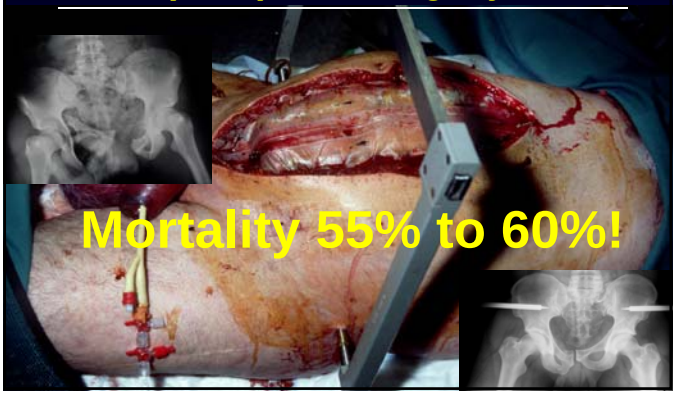
What is the role of pelvic packing?

Philip F. Stahel, MD, FACS
Department of Orthopaedics
Denver Health Medical Center

What's the problem?



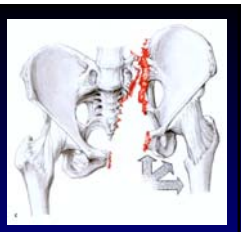
Complex pelvic ring injuries

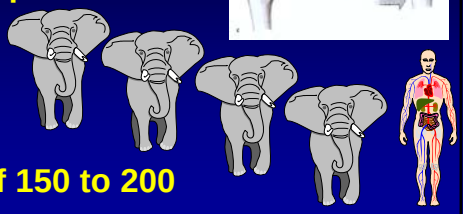


Hidden dangers!

QUESTION:

> How much force does it take to cause pelvic ring disruption?



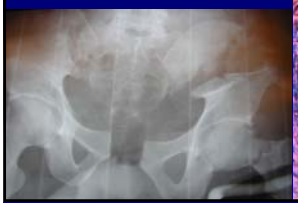


ANSWER:

> G forces of 150 to 200

> *e.g.* 150 lb person x 150 G = <u>11.25 tons</u>!

Who is at risk?



ORIGINAL ARTICLE

Early Predictors of Mortality in Hemodynamically Unstable Pelvis Fractures

Wade Smith, MD, Allison Williams, ND, PhD,* Juan Agudelo, MD,* Michael Shannon, MD,* Steven Morgan, MD,* Phillip Stahel, MD,* and Ernest Moore, MD†*

1. Age (> 60 years)
2. Injury severity (ISS, RTS)
3. Head injury (GCS)
4. Blood transfusions

Smith et al., *J. Orthop. Trauma* 2007, 21:31-7.

Predictor - Age ?

"It's bad to be old and break your pe[illegible]"

Can't be modified !

Predictor - Injury severity ?

Can't be modified !

Predictor – Head injury ?

Can‘t be modified !

ORIGINAL ARTICLE

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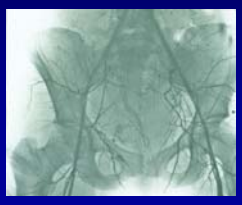
1. Age
2. Injury severity
3. Head injury
4. Blood transfusions !

Smith et al., *J. Orthop. Trauma* 2007, 21:31-7.

How can we reduce the number of blood transfusions?

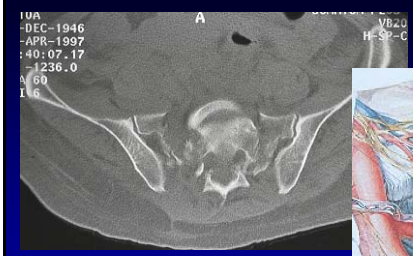
Question #1

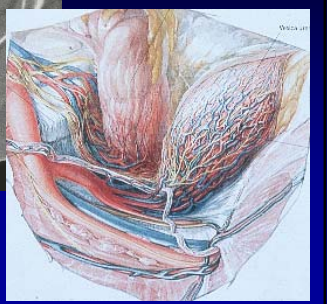
How can you stop a <u>venous</u> bleeding by angiography



?

Traumatic pelvic hemorrhage





Main source:
<u>venous</u> plexus!!!

Question #2

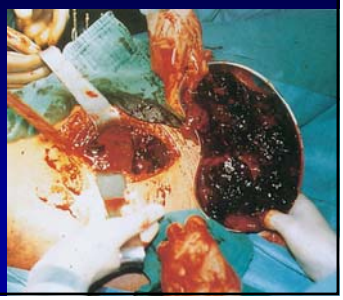
Can we afford a delay of <u>2.5 h</u> during the "golden hour"

?

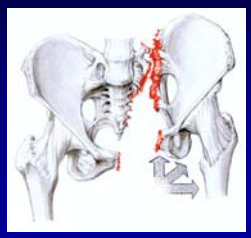
Question #3

Retroperitoneal self-tamponade ?

No !

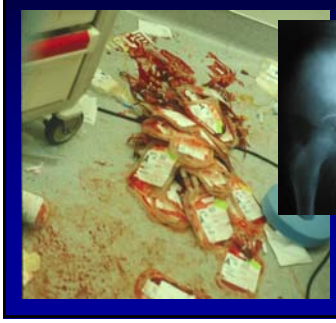


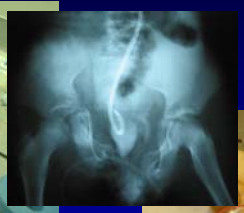
Don‘t underestimate the elephant‘s weight!

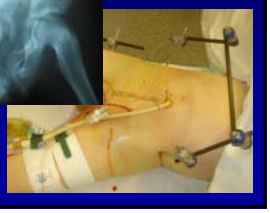


The answer to all questions:

“Damage control“ with pelvic packing !





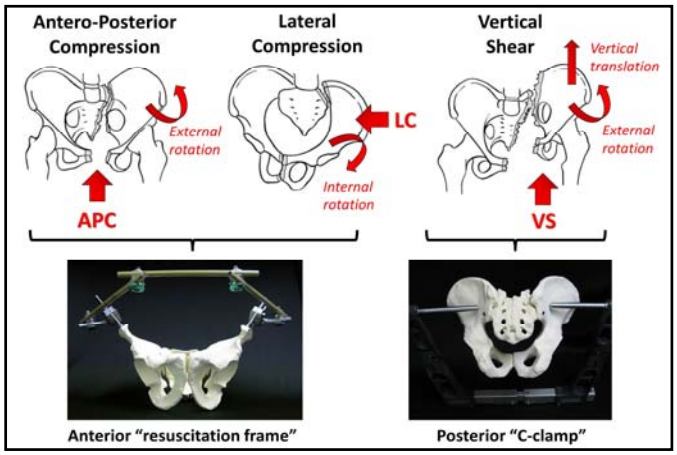


Rationale for "Damage control" –
Desperate measures in desperate times!

Preperitoneal Pelvic Packing/External Fixation with Secondary Angioembolization: Optimal Care for Life-Threatening Hemorrhage from Unstable Pelvic Fractures

Clay Cothren Burlew, MD, FACS, Ernest E Moore, MD, FACS, Wade R Smith, MD, FACS, Jeffrey L Johnson, MD, FACS, Walter L Biffl, MD, FACS, Carlton C Barnett, MD, FACS, Philip F Stahel, MD, FACS

Cothren Burlew et al., *J. Am. Coll. Surg.* 2011, 212:628-37.



Preperitoneal pelvic packing

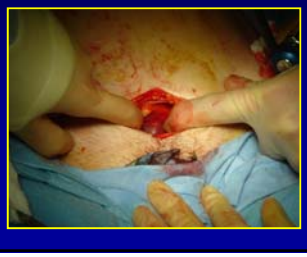
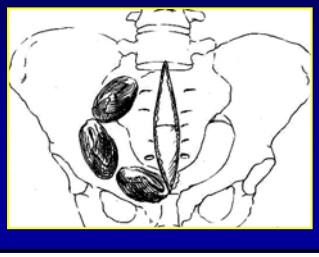
It's fast !


Preperitoneal pelvic packing

It's safe !

Preperitoneal pelvic packing

It's easy !

Preperitoneal pelvic packing

Preperitoneal pelvic packing

Severe pelvic ring injuries

Hallmark of patient's survival:

Rapid recognition and control of hemorrhage !

Endpoints of resuscitation

- Stable hemodynamics
- No need for vasoactive or inotropic stimulation
- Serum lactate < 2.5 mmol/L
- Normal coagulation
- Normothermia
- Urinary output > 1 mL/kg/hour

Endpoints of resuscitation – translated into "Orthopaedic language":

"A resuscitated trauma patient is one in whom the bleeding has been stopped"

Orthopaedic priorities in polytrauma

Surgical timing based on physiologic status:

Physiologic status	Surgical intervention	Timing
Stable (responder) Unstable (nonresponder)	Early definitive care "Damage control"	day 1
Hyper-inflammation	"Second looks" and change of packing	day 2–4
"Time-window of opportunity"	Scheduled definitive surgery	day 5–10
Immunosuppression	No surgery!	> day 10
Recovery	Secondary reconstructive surgery	> week 3

Stahel et al., *Injury* 2009, 40 (Suppl.4):S27-35.

Worst case scenario?

Worst case scenario!

“Don’t poke a skunk !”