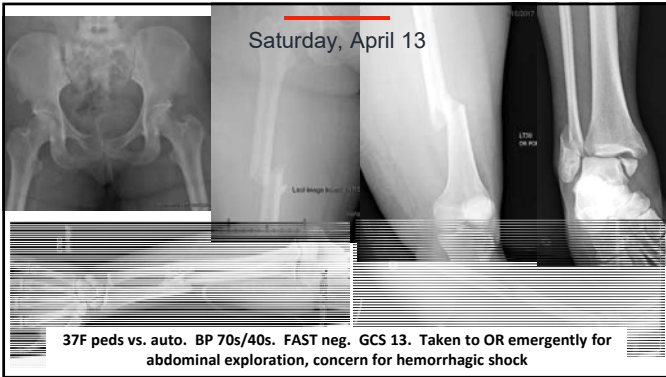


DCO: Priorities

Mara Schenker, MD



Early Total Care (ETC)

Definitive fixation of fractures within 24 hours

Advantages:

- Fracture stability
- Decreased pain
- Ease of nursing care
- Improved patient positioning in ICU
- Decreased fat emboli
- Avoidance of "second hit" with future surgery

Damage Control Orthopaedics (DCO)



provisional fixation, delayed definitive fixation
multitrauma (hemodynamic instability, neuro/chest trauma)

Pape Ann Surg 2007: decreased pulmonary complications
Morshed JBIS 2009: lower mortality with delayed femur fixation

how do we decide?

trauma is a team sport



how do we decide?

Clinical judgment / experience

variable across institutions
Shock trauma 12% DCO
Denver health 57% DCO



what are my priorities?

Life
limb
function

what are my priorities?

Life — how can You save a life?

limb
function



what are my priorities?

Life — What can kill you?

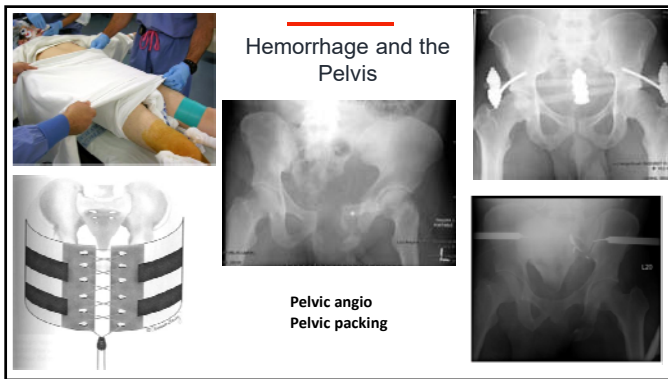
limb
function

Hemorrhagic shock

Advanced Trauma Life Support Classification of Hemorrhage™			
Class	Average Blood Loss (mL)	Blood Volume (%)	Common Signs and Symptoms
I	<750	<15	No changes in heart rate, respiratory rate, or blood pressure
II	750-1,500	15-30	Tachycardia and tachypnea; systolic blood pressure may be only slightly decreased; slightly reduced urine output (20-30 mL/hr)
III	1,500-2,000	30-40	Marked tachycardia and tachypnea, cool extremities with significantly delayed capillary refill, decreased systolic blood pressure, decreased mental status, decreased urine output (5-15 mL/hr)
IV	>2,000	>40%	Marked tachycardia, significantly decreased systolic blood pressure, cold and pale skin, severely decreased mental status, negligible urine output

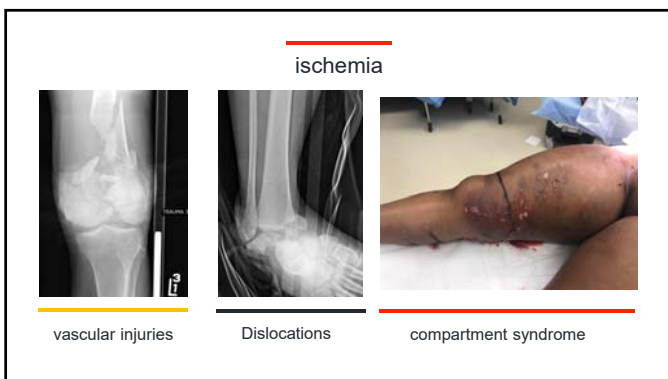
Resuscitation

- Limited crystalloid resuscitation with permissive hypotension
Dutton J Trauma 2002
Bickell NEJM 1994
- 1:1:1 resuscitation
Holcomb Ann Surg 2008
 - pRBCs
 - FFP
 - Platelets



what are my priorities?


Life
limb: ischemia, wounds, long bone/pelvis stability
function



wounds




The solution to pollution is....



Long Bone Stability

Ex fix is the work-horse of DCO



- reduces blood loss
- decreased SIRS response
- minimizes ongoing soft tissue risk

what are my priorities?

Life
limb
function = conversion to definitive fixation and restoration of anatomy

conversion of long bone ex fix

Optimaler Zeitpunkt der Sekundäroperation bei Polytrauma

Eine Evaluation an 4314 Schwerverletzten **Optimal timing for secondary surgery in polytrauma patients: an evaluation of 4314 serious-injury cases**

H.C. Pape, M. Stulp, M.v. Grönroos, A. Weinberg, M. Dahlweit und H. Tichener
Unfallchirurgische Klinik (Direktor: Prof. Dr. H. Tichener), Medizinische Hochschule Hannover

- 4314 polytrauma patients
- Avoid the “second hit” window (Days 2-4)
- Higher rates of multiple organ failure with secondary surgery in window with SIRS response

Resuscitation End Points

Recognizing Compensated Shock:

inadequate tissue perfusion despite normal BP, HR, UOP

Lactate

- In the absence of sufficient oxygen, pyruvate converted to lactate
- Indirect measure of oxygen debt
- Metabolic acidosis

J.Trauma, 1993 Oct;35(4):584-6; discussion 588-9

Lactate clearance and survival following injury.

Abramson D¹, Scatena TM, Hirschcock R, Trooskin SZ, Henry SM, Greenspan J.

- Normal (< or = 2 mmol/L)
- Within 24 hrs 100% survival
- 24 - 48 75% survival
- > 48 hrs 15% survival

Resuscitation End Points

Recognizing Compensated Shock:

inadequate tissue perfusion despite normal BP, HR, UOP

Base deficit

- Marker of global tissue acidosis
- Surrogate for inadequate tissue perfusion
- The amount (in base) to restore pH to 7.40

J.Trauma, 1996 Oct;28(10):1464-7.

Base deficit as a guide to volume resuscitation.

Davis JW¹, Shackford SR, Mackenzie RC, Hoyt DB.

- Mild 2 to -5
- Moderate -6 to -14
- Severe < -15

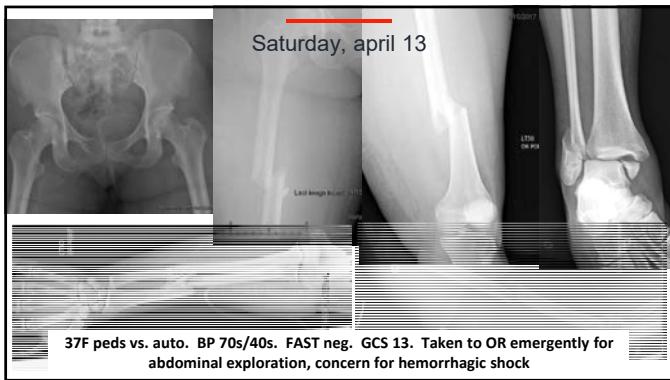
J.Trauma, 1992 Sep;33(3):417-23.

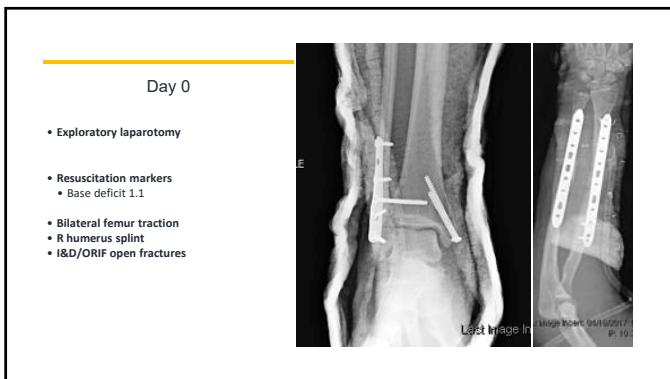
Base deficit stratifies mortality and determines therapy.

Rutherford EA¹, Morris JH Jr, Reed GW, Issel KS.

- 3791 patients
- Base deficit of -15 mmol/L significant marker for mortality









Overnight




Interventional radiology: embo R obturator
Base excess 0.6



Day 4



DCO: Priorities

 Life	 Limb	 Function
Hemorrhage Trauma conversations Systemic markers	Ischemia Wounds Long bone/pelvic stability	Definitive fixation Restore anatomy

Thank you