

## Damage Control Orthopedics Five Tricks for Lower Extremity Injury



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## History

- "Damage control" originally coined by US Navy
  - reference to keeping afloat a badly damaged ship
  - limit flooding, stabilize the vessel, isolate fires and explosions, and avoid their spreading
- In abdominal surgery, refers to maneuvers designed to ensure patient survival
  - staged strategy for treatment of severe bleeding injury
- Damage control orthopedics (DCO) applied to the management of multi-injured patients with long bone and pelvic fractures

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## 4 Phases

- 1 - acute phase - life-saving procedures performed
- 2 - second phase
  - minimizing the degree of surgical insult to the patient*
  - control of hemorrhage
  - temporary stabilization of major skeletal fractures
  - management of soft tissue injuries
- 3 - monitoring period in ICU
- 4 - definitive fracture fixation

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## Now 2 Camps Formed



- DCO (Damage Control Orthopedics)



- Acute Fixation



"Don't worry Honey there isn't anyone for miles!"

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## What Do (*we think*) We Know

- It's the severity of injuries and not the timing to fracture fixation
- Incidence of pulmonary complications parallels frequency of initial thoracic injury
- Clinical judgment remains most important determinant
- ISS >18 "probably ok" with early surgery
- ISS < 18 "preferable to wait"
- Other newer methods better at detecting resuscitation
  - Lactate levels
  - Mediators of the inflammatory response, such as *IL-6*, *IL-8*, *IL-10*, HLA-DR class-II molecules

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## Goals

- Sufficient stabilization of fractures to prevent
  - further tissue damage
  - potential compartment syndrome
- Allows patient to be mobilized for tests
- Allows for improved pulmonary care

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## External Fixation

- DCO workhorse
- Rapid application
- Reduced blood loss
- Minimally invasive



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## Other Options

- Fracture below knee
- Simple splint



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## Other Options

- Femur Fracture
  - Splint alone generally not helpful to immobilize hip
- Skeletal traction = to external fixation in terms of:
  - acute respiratory distress syndrome (ARDS)
  - multiple organ dysfunction syndrome (MODS)
  - Pneumonia
  - deep venous thromboembolism (DVT)
  - pulmonary embolism (PE)
  - ICU stay
  - death rate



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## Compartment Syndrome

- Quick, easy
- Life/Limb Saving
- Can be done at bedside
  - ER/ICU



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## Amputation

- Rare to do on admission
- If patient in extremis can be life saving
- Weigh risks and benefits of saving in short term
  - If like going to amputate in future may be better to do immediately

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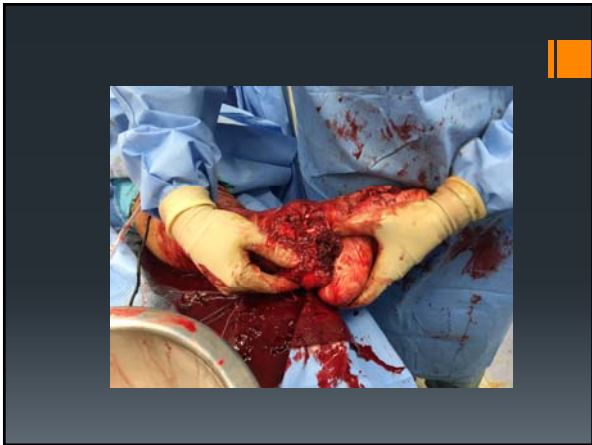
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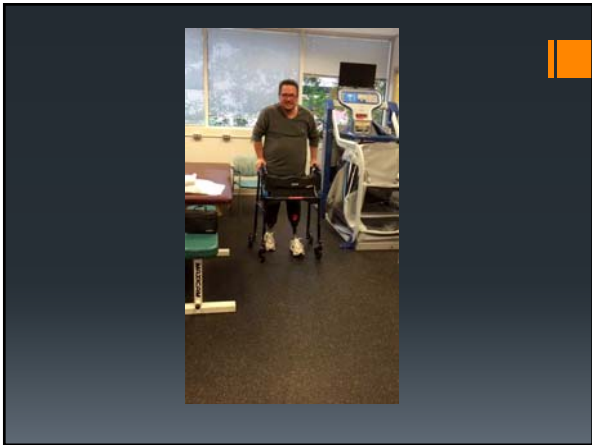
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