

Damage Control In The Community Setting

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Disclosure

Paid Consultant for:
Stryker Trauma



Disclosure

Research Support:

OTA



Disclosure - Archdeacon

Speaker Board:

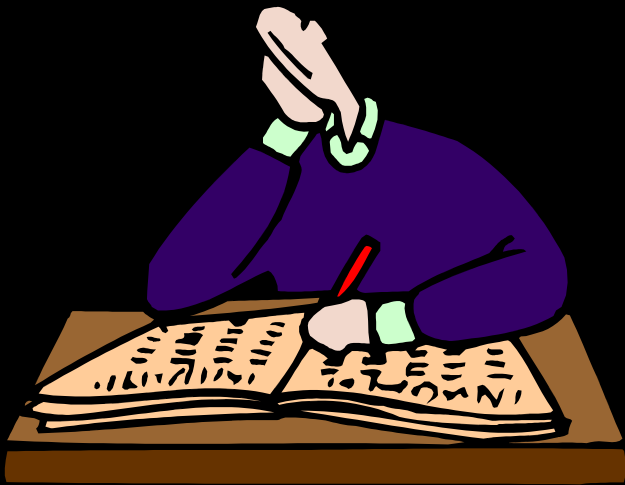
*AO North America; Smith &
Nephew; Stryker*



Disclosure

Editorial Board:

*JOT; JBJS;
JOR; JAAOS;
CORR*



Devastating Traumatic Injuries



Objectives

- ✓ How Does The Trauma Surgery Service Interact With The Orthopedist?
- ✓ What Is Damage Control In The Community Setting?
- ✓ What Procedures Are Appropriate Prior To Transfer From A Referral Source?
- ✓ Are Damage Control Techniques Safe & Cost Efficient?
- ✓ What Changes Are Coming Down The Road That Might Effect Referral Relationships?

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THE PROBLEM



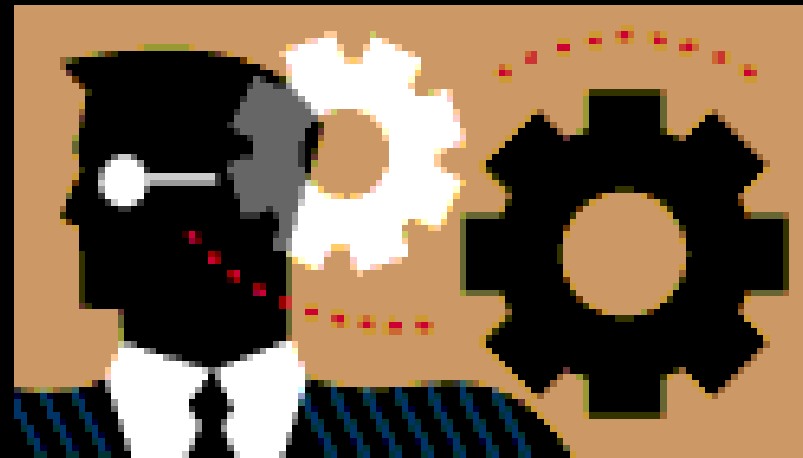
**Trauma
/ Injury**

Treatment



Assessing Injury

- ✓ Resuscitation
- ✓ Injury Surveys
- ✓ Emergent Intervention
- ✓ Surgical Intervention
- ✓ Definitive Intervention



Dynamic / Integrated Process

Resuscitation

Damage Control Orthopaedics

Intervention

Definitive
Intervention

Intervention

Systemic Effect

✓ Analogy

View The Traumatic Injured Patient As A Wound

- Inflammatory Response
- Necrotic Or Devitalized Tissue
- Ischemic Or Hypoxic Region

❖ The Larger The Insult; The Larger The Inflammatory Response

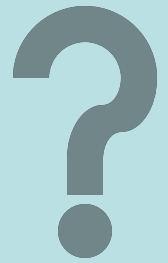
✓ Host Survival Depends On

Systemic Metabolic Response

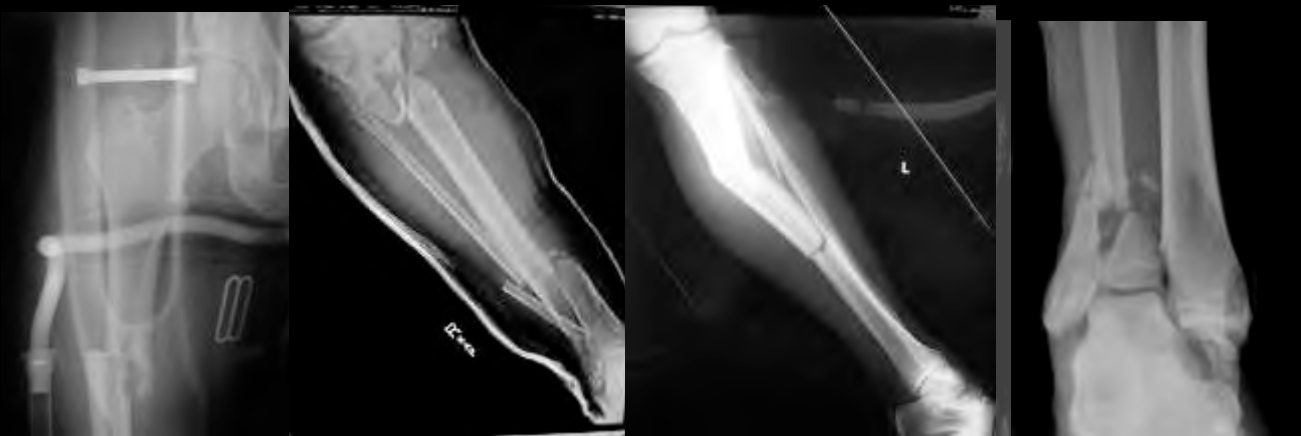
Treatment



Orthopaedic Management



- ❖ “Do You Need To Operate?”
- ❖ “When Do You Need To Operate?”
- ❖ “How Much Surgery Is Required?”
- ❖ “Do I Have The Resources?”
- ❖ “Do I Have The Skill Set?”



Principles Of Treatment

- ✓ Bring The Limb Out To Length
- ✓ Restore Gross Alignment
- ✓ Obtain Adequate Images
 - ❖ Plain Films
 - ❖ Contralateral Side
 - ❖ CT
- ✓ Definitive Reconstruction When The Soft Tissues Permit



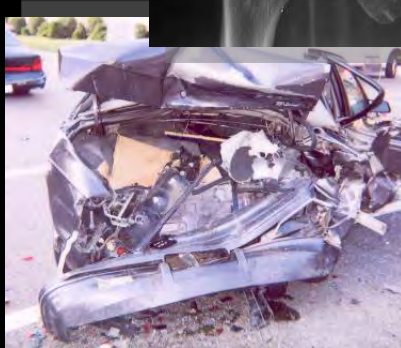
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Process Applied

Trauma Center

Community Setting



Definitive Care

Windows Of Opportunity
Will Occur Which Allow
For Definitive Treatment

✓ Trauma Center

- ❖ Repeat Wound Debridements
- ❖ Conversion Ex Fix to Definitive Fixation
 - Articular Reconstructions
- ❖ Wound Closure / Coverage

Wound Debridements

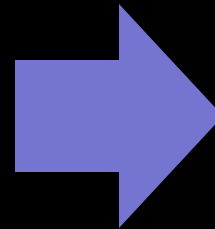
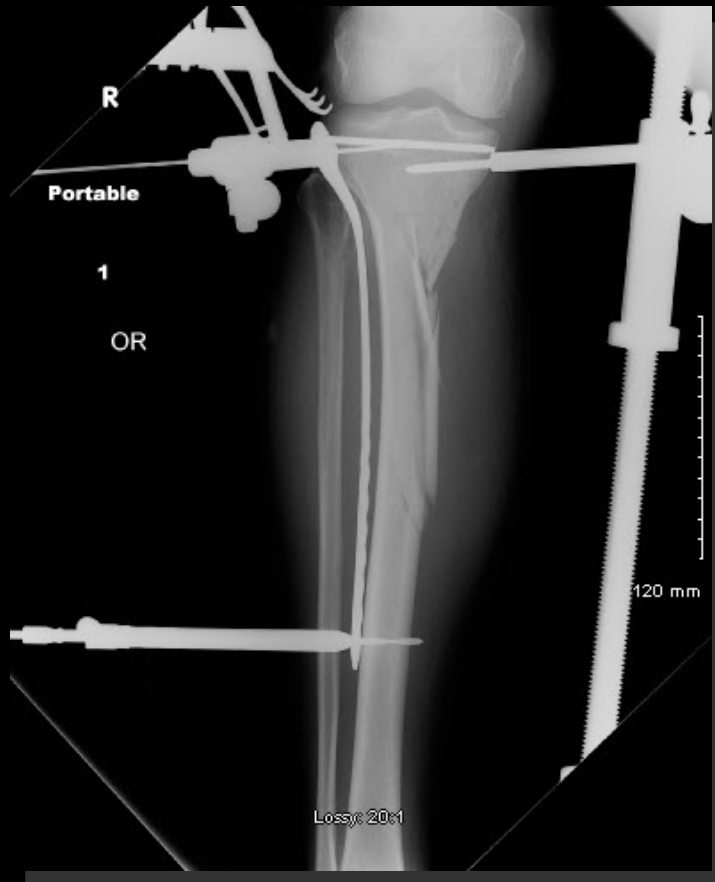


✓ All Fractures
Have Some
Degree Of Soft
Tissue Injury

❖ Prevent
Infection

- Debridement
- Antibiotics
- Irrigation

Articular Reconstructions



Wound Closure / Coverage



Definitive Care

Windows Of Opportunity
Will Occur Which Allow
For Definitive Treatment

✓ Community

❖ Definitive Stabilization

- ORIF Hip Fx's
- Tibia Fx IM Nails
- ORIF Plateau & Pilon Fx's

❖ Transfer To Tertiary Care Center For Staged Treatment

Hip Fx's

✓ Early Provisional Immobilization

❖ Buck's Tx

✓ Definitive ORIF

❖ When Soft Tissue Envelope Amenable

- Medically Optimized



Tibia Fx's

✓ Early Provisional Immobilization

❖ Splint

✓ Definitive Rx

❖ When Soft Tissue Envelope Amenable

- Fasciotomies ???
- IM Nail – Protect Soft Tissues



Periarticular Fx's



- ✓ Early Provisional Immobilization
 - ❖ Spanning Ex Fix
- ✓ Definitive ORIF
 - ❖ When Soft Tissue Envelope Amenable To Open Procedure



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Appropriate Pre-Transfer Rx

- ❖ Excisional Debridement – Open Fx's
- ❖ Fasciotomies – Compartment Syndrome
- ❖ Spanning Ex Fix – Periarticular Fx's
- ❖ Binder / Sheet Wrap – Pelvic Ring Injuries
- ❖ Hip Reduction – PW Acetab Fx / Dx



Excisional Debridement

✓ Surgical Urgency

❖ ? Emergency

- Clinical Studies Have Not Demonstrated Significant Negative Outcome In Delay To OR

❖ Depends On Severity Of Injury



Treatment Principles

All Open Fractures Goes To The OR In A Timely Manner



Excisional Debridement

❖ Convert Traumatic Wound Into Surgical Wound

- Excise Nonviable & Contaminated Tissue
 - Skin
 - SQ
 - Fascia
 - Muscle
 - Bone



Fasciotomies

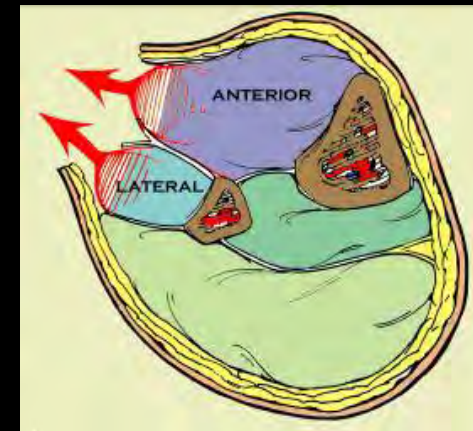
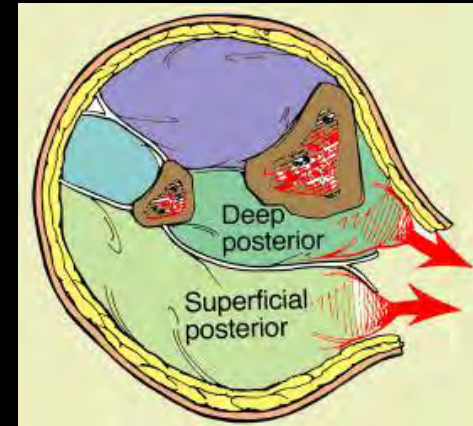
Emergent Decompression

A clinical diagnosis

❖ Your patient will tell you they have it

- Pain out of proportion
- Pain with passive stretch

❖ Depends On Severity Of Injury



Spanning Ex Fix

✓ Provisional
Stability of
Periarticular Fx's

- ❖ Stabilize Fx
- ❖ Protects Soft Tissue
 - Allows Access To Wounds
 - Easy N/V Evaluation
 - Elevation



Pelvic Sheet Wrap / Binder

✓ Provisional Pelvic Stability

- ❖ Sheet Wrap

- ❖ Pelvic Binder

- Decrease Pelvic Volume
- Prevent Further Hemorrhage

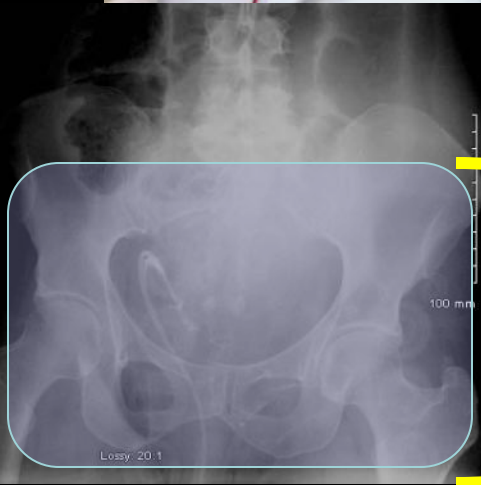
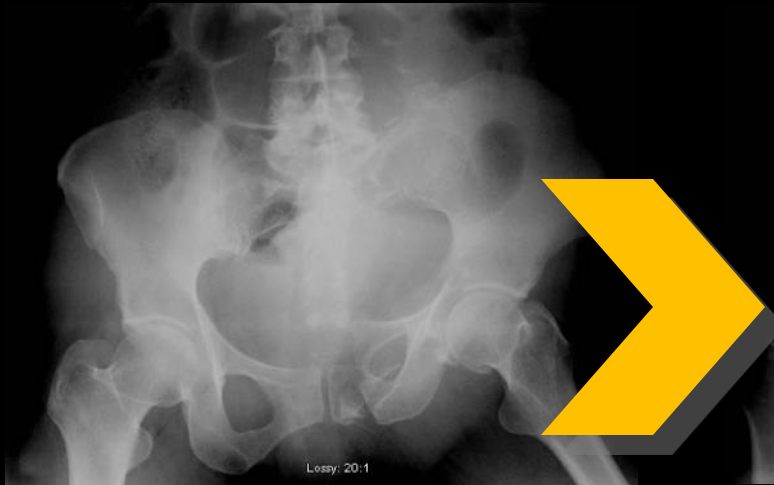


Sheet Wrap



- ❖ Not At Iliac Crests
- ❖ Not A Rope Around The Pelvis

Pelvic Binder



Pelvic Binder

Hip Dx Reduction

✓ Orthopaedic
Urgency

❖ Increased Risk Of
Osteonecrosis
With Longer
Duration Of Dx

✓ Get The Hip Back
In ASAP!!!





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(Cost) Effectiveness Of Trauma Centers

- ❖ Triage And Transport Systems To Designated Trauma Centers Demonstrated A Decrease In Morbidity & Mortality
 - Nathens et al; JAMA 2001
 - Sampalis et al; J Trauma 1997
 - Sampalis et al; J Trauma 1995
- ❖ Morbidity And Mortality Decrease When Care Is Provided At Regional Trauma Centers
 - MacKenzie et al; N Engl J Med 2006
 - Demetriades et al; Ann Surg 2005
 - Mullins et al; JAMA 1994
- ❖ Additional Cost At A Trauma Center Versus Non-Trauma Center Is Only \$36,319 For Every Life-year Gained Despite The Fact That Initial Care In Trauma Centers Is 71 Percent Higher Than In Non-Trauma Centers
 - MacKenzie et al; J Trauma 2010

✓ In Most Circumstances, Patient Outcomes Benefit And Expenses Are More Cost Effective From Regionalized Trauma Systems

(Cost) Effectiveness Of Damage Control

✓ Treatment With Damage Control Principles Appears To Be Safe

- ❖ OR Time & EBL Decreased With Damage Control Versus ETC
- ❖ Damage Control Not Associated With More Complications
 - Taeger et al; J Trauma 2005

✓ Non-Emergent Orthopaedic Procedures At Night

- ❖ More Revision Surgeries & Hardware Removals Than Daytime Surgery
- ❖ No Difference In Infection, Nonunion Or Radiation Exposure Rates
 - Ricci et al; JBJS 2009

✓ Caveats

- ❖ Damage Control Probably Most Beneficial With Common Sense
- ❖ Make Care Decisions Based On Patient Factors
- ❖ Follow The “Golden Rule”
 - Due On To Others As You Would Like Done To Your Family

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Changes In Trauma Care

- ✓ “Hospitalization” Of Physician Practices
 - ❖ Physicians In Increasing Numbers Are Becoming Hospital Employees
 - This May Make Sense For Orthopaedic Trauma Surgeons
 - Poor Payer Mix
 - Transfers From Other Facilities
 - Hospitals May Require That Patients Stay In The “System”
 - May Or May Not Be The Best Care For Specific Patient Problems

Changes In Trauma Care

- ✓ “Supply” Of Orthopaedic Trauma Surgeons Outstripping “Demand”
 - ❖ 70-85 Fellowship Trained Traumatologists Per Year
 - 2010-2012 = 200+ New Ortho Trauma Surgeons In The Market
 - 15-20 Or So Retiring Per Year (Unofficial)
 - 50+ Surplus Per Year
- ✓ Orthopaedic Call / ED Coverage
 - ❖ Fewer Orthopaedic Surgeons Interested In Call
 - Many Reasons
 - Opportunity For General Surgeons – Acute Care Surgery

Radical Approaches



Damage Control – Take Home Points

- We Are The Musculoskeletal Advocates
- DC - Care Within Our Skill Set (You & Institution)
- Appropriate Basic Ortho Care Before Tx
- DC Is (Cost) Effective
- Times Are Changing



Thank You