What's New in Orthopedic Trauma: Trauma Call From Haiti to California

California Orthopedic Association Annual Meeting April 18, 2010

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- Dr. Jeffrey Smith
- Dr. David Hoyt ACS Executive Director
- Dr. Christopher Born

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Objectives – Haiti Trauma Call

- Timeline of orthopedic trauma response
- Describe difficulties and problems
- Success stories
- My team's experiences
- Future of orthopedic care in Haiti
- Future of disaster preparedness in the US

On Tuesday January 12, 2010 at 4:53pm an earthquake of 7.0 Mw struck Haiti just southwest of Port-au-Prince resulting in catastrophic devastation.

There were an estimated 230,000 deaths with approximately 300,000 more seriously injured. The Haitian government estimated that an additional 1,000,000 people were immediately made homeless.

First Week

- Chaos, challenges
- Search and Rescue
- US Military
- PaP Airport initially closed then controlled by USAF
- PaP hospitals overwhelmed
- Dominican Republic
- Selected NGO's
- Partners in Health/Synthes
- University of Miami Field Hospital
- Amputations, open fractures
- Insufficient supplies
- Civil unrest

First Week

"The issues we were unprepared for and witnessed were:

1. The amount of human devastation
2. The complete lack of a medical infrastructure in the country
3. The lack of support of the Haitian medical community
4. The complete lack of any organization on the ground.
5. Lack of any security at all at the hospital"

Dr. Dean Lorich

- No running water
- No electricity
- No sterility
- No medical records
- Low level of medical care prior to the earthquake

Second Week

- Still no central organizing force
- USNS Comfort arrives
- Dangerous situations resolving, supplies improving
- Multiple orthopedists signed up on volunteer lists
- NGO's placing surgeons in Port-au-Prince and other major cities
- AAOS website
- Assessments beginning to filter back to US
- Advised to travel in large group and ship as much equipment as possible
- Decided to assemble a team from VCMC
- Started raising money and collecting supplies

4^{th} – 6^{th} Week

- PaP Airport resumes some commercial flights
- Local flights resume
- Very few open fx and amputations
- Focus shifted to closed fxs, malunions, nonunions, ongoing infection debridements
- Tent settlement problems
- VCMC team leaves for Haiti

Ventura, California Team

Emily Benson - Orthopedic Surgeon, team leader

Lisa Martel - logistics, donations, supplies

Leticia Rodriguez - logistics, donations, supplies

Javier Romero - General Trauma Surgeon

Ventura, California Team

John Taketa - Orthopedic Surgeon, out-patient specialist

Kelly Brooks

Physician Assistant

Chris O'Connor

OR nurse

Eva Orozco

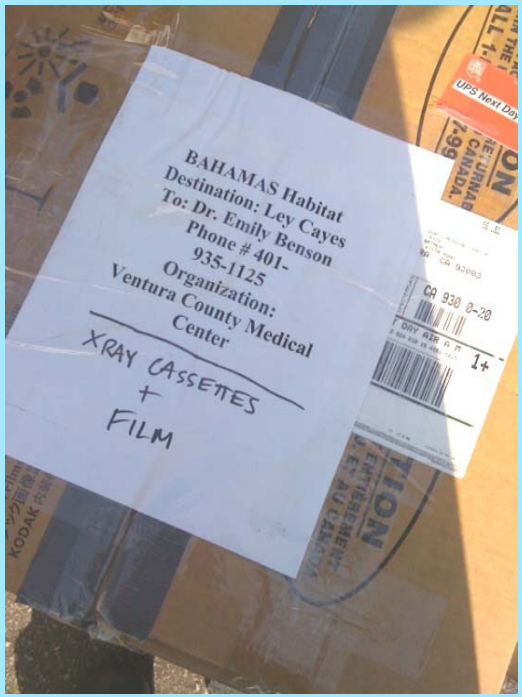
out-patient nurse

Michelle Roth

Cast tech

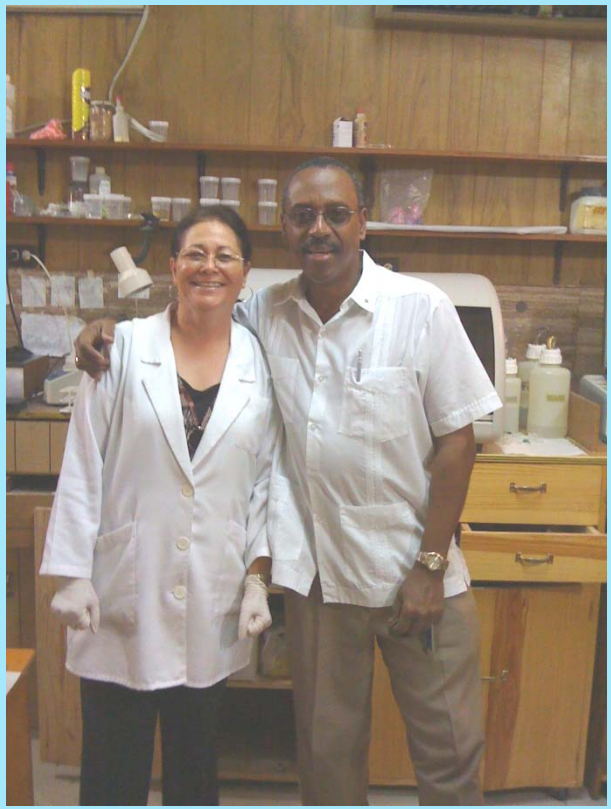
Equipment

- Large amounts of equipment were donated by the hospital and local vendors, including implants, antibiotics, dressings, casting supplies, and toys. Over 2000lbs of supplies were shipped



Rosa and Dr. Robert Leger

- Sister and brother-in-law to Eva Orozco
- Haitian general surgeon born in town of Les Cayes
- Dedicated his life and career to the health and progress of his people
- Rotary Club
- Along with their daughter, Rosanne, they recruited US orthopedic surgeons (Vanderbilt University) after the earthquake to come to Les Cayes



Les Cayes is a town in the southwest region of Haiti approximately 120 miles from Port-au-Prince. The population has been estimated at 50,000. In the week after the earthquake they saw an influx of at least 30,000 people.

There are two hospitals located in Les Cayes

<u>The Brenda Strafford Institute</u>:

Canadian charity hospital dedicated to eye and ENT surgery

<u>Les Cayes General Hospital</u>:

Public hospital

The Brazilian Team

Expedicionarios da Saude

- Sponsored by Brazilian Medical Associations and Societies
- Designed to make medical missions to the Amazon Yanomamo natives
- Exceptional group of doctors and technicians
- Traveled with full supplies and equipment

The Brazilian Team

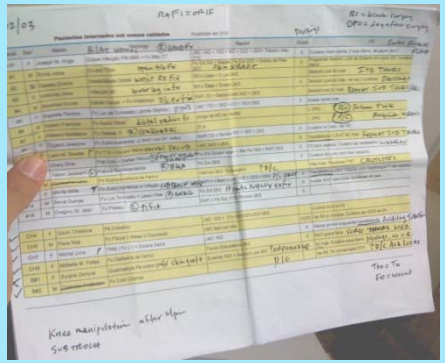
3 orthopedists, 2 general surgeons, 4 anesthesiologists, multiple nurses and techs

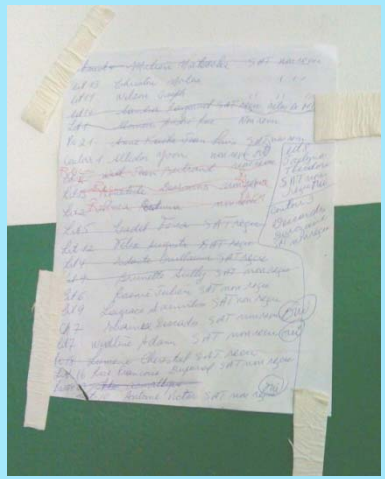
The Brenda Strafford Institute

- Dedicated one full in-patient ward to orthopedic patients
- Open ward housed approximately 40 inpatients

The Brenda Strafford Institute

Rounds were made every morning with the combined Brazilian and US team. Orders written and decisions were made about which patients needed to be added to the OR schedule.



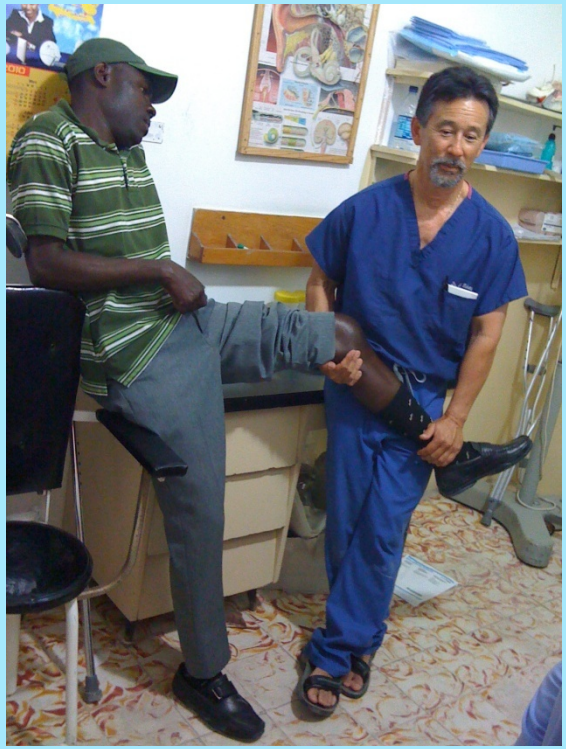


The Brenda Strafford Institute

- Tents outside on the grounds housed homeless patients
- Local orphanages housed additional patients

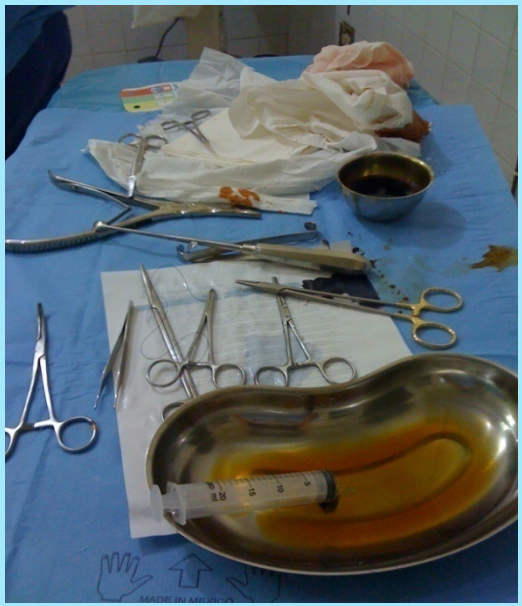
The Brenda Strafford Institute

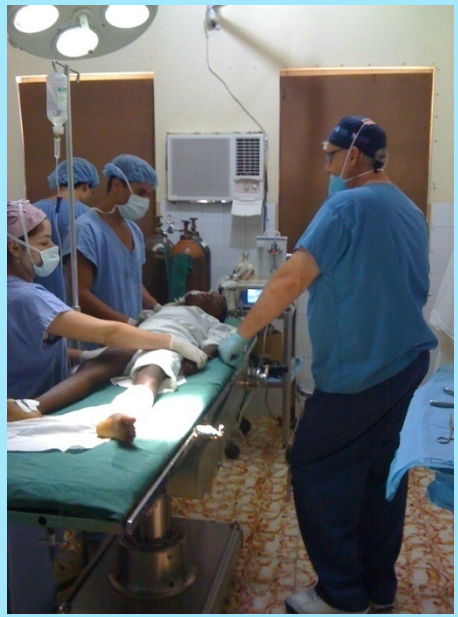
Outpatient clinic: volume nearly doubled everyday we were there once the word got out that orthopedic problems were being seen



The Brenda Strafford Institute

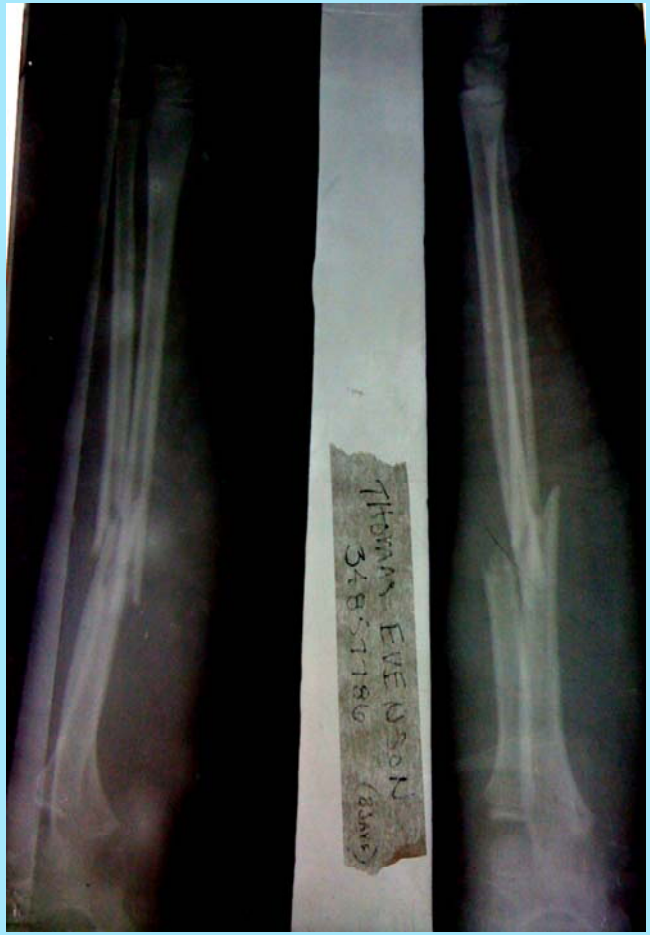
2 functional operating rooms with very limited resources. Small autoclaves. No suction. No orthopedic equipment or implants. No A/C. Marginal sterility.





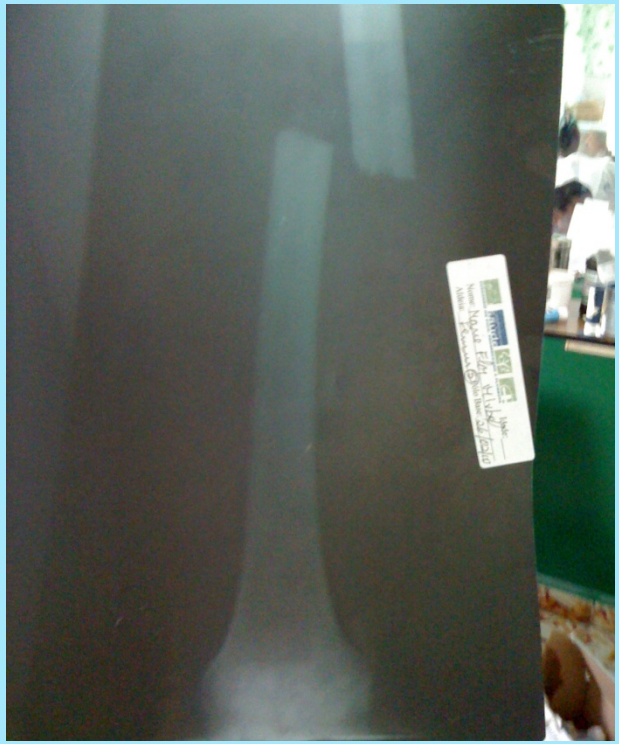
Operative Cases

- Majority of cases were irrigations and debridements of infections caused by the earthquake
- Osteomyelitis
- Acute fracture fixation
- Malunions, nonunions from the earthquake
- Exfix revisions



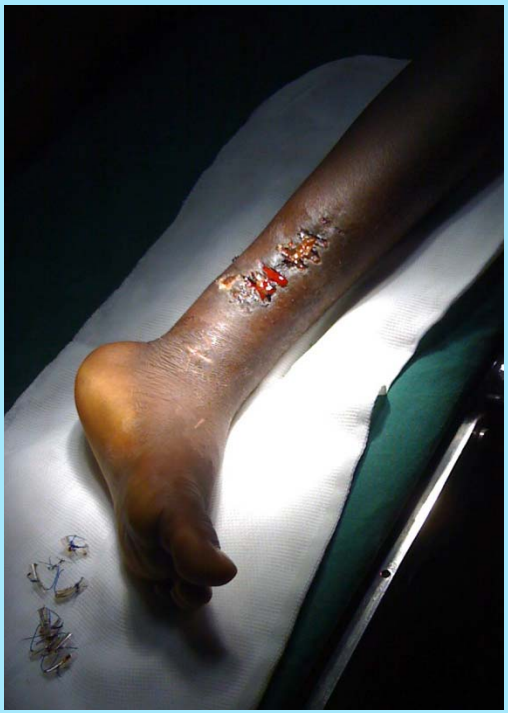
Example Operative Cases

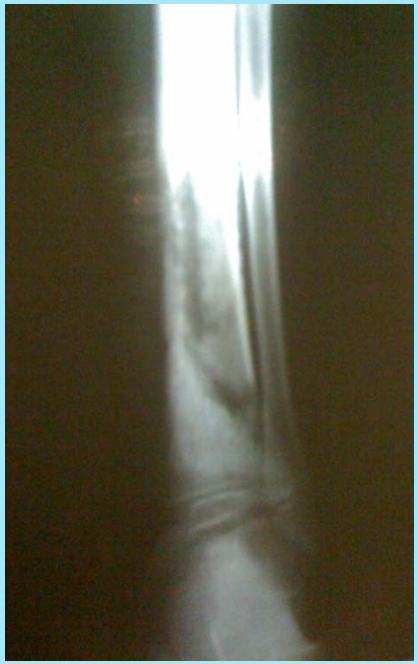
- Fresh midshaft femur in 23 year old female. Required open plating due to no fluoroscopy available.



Example Operative Cases

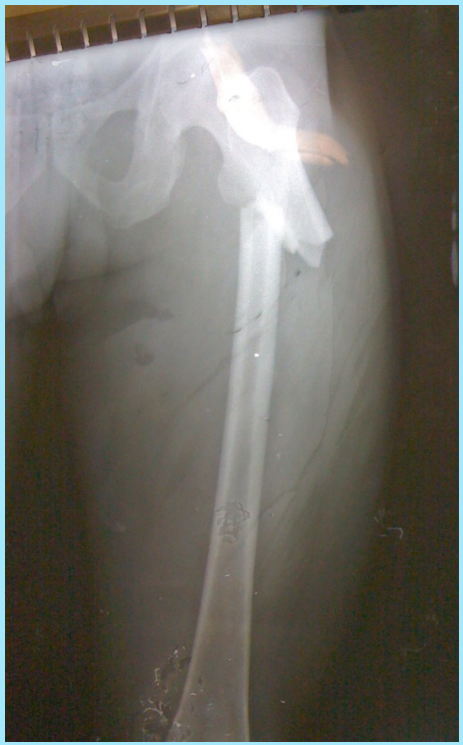
- 6 year old girl with open crush injury to lower leg during earthquake resulting in osteomyelitis

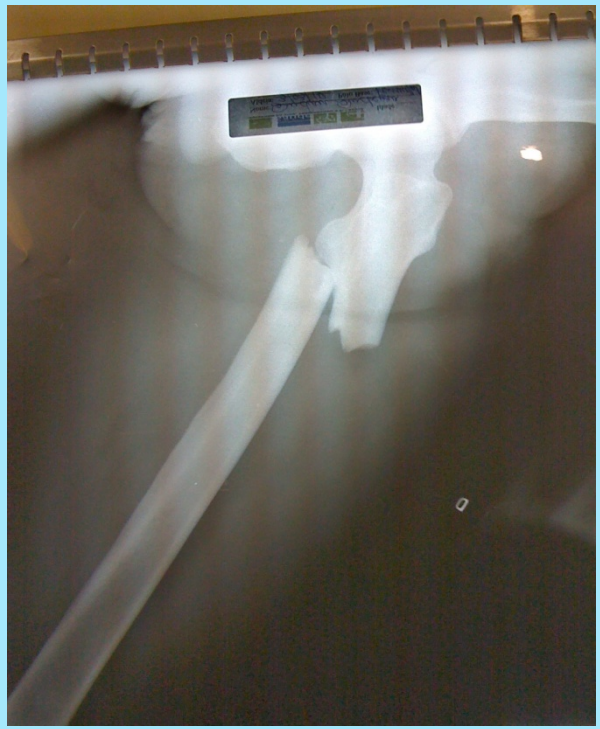




Example Operative Cases

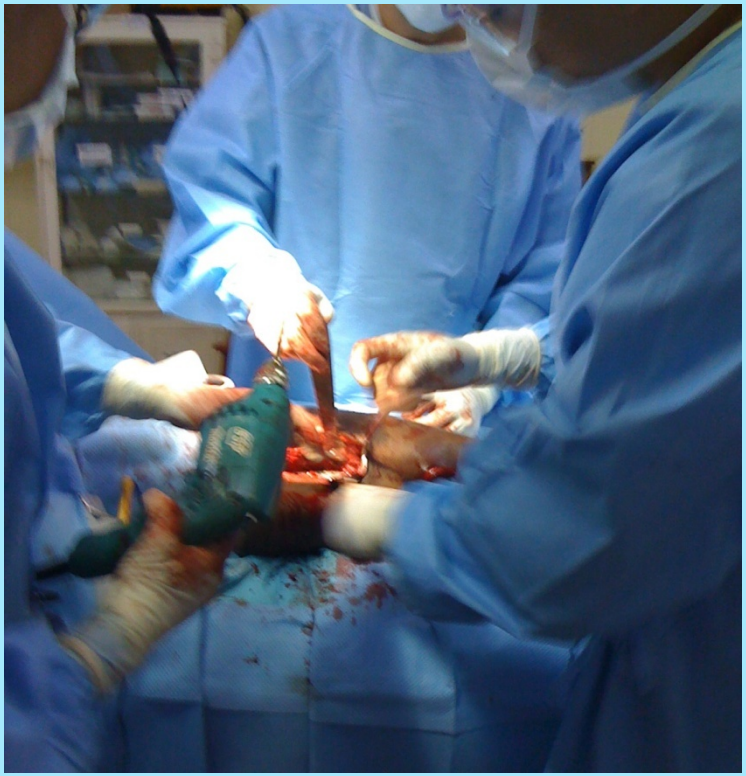
- 70 year old male with acute subtroch femur fracture brought in to out-patient clinic on a stretcher by his family members

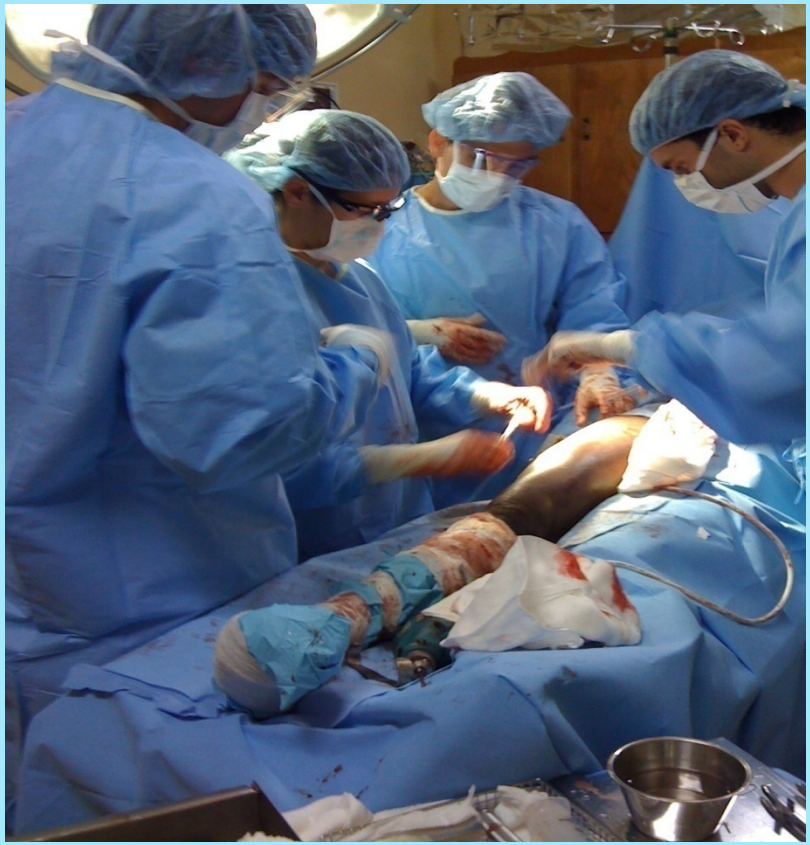




Example Operative Cases

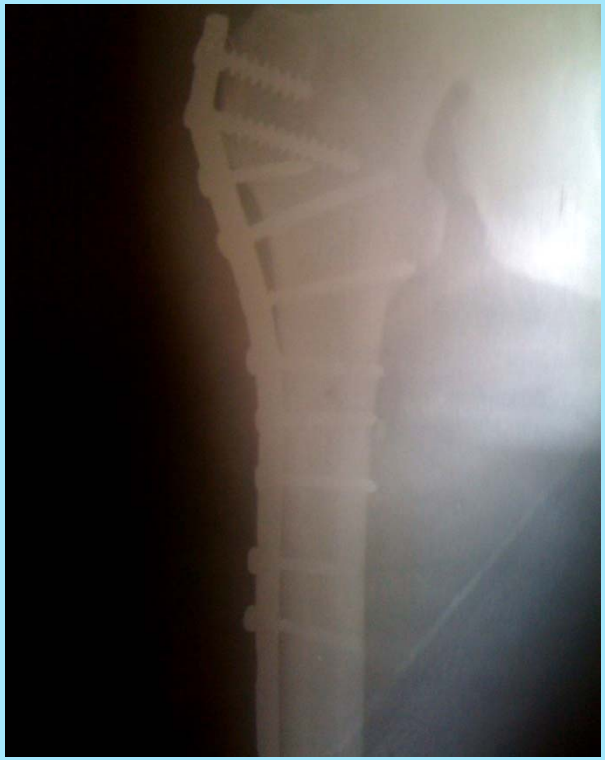
- All surgeries done under regional anesthetic with sedation
- Limited post op pain control

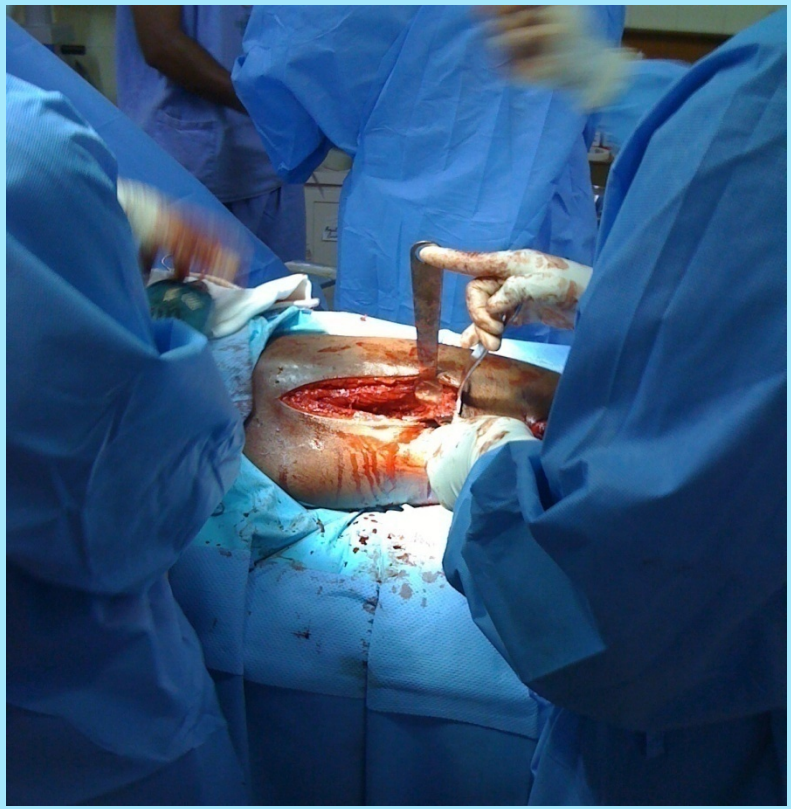




Example Operative Cases

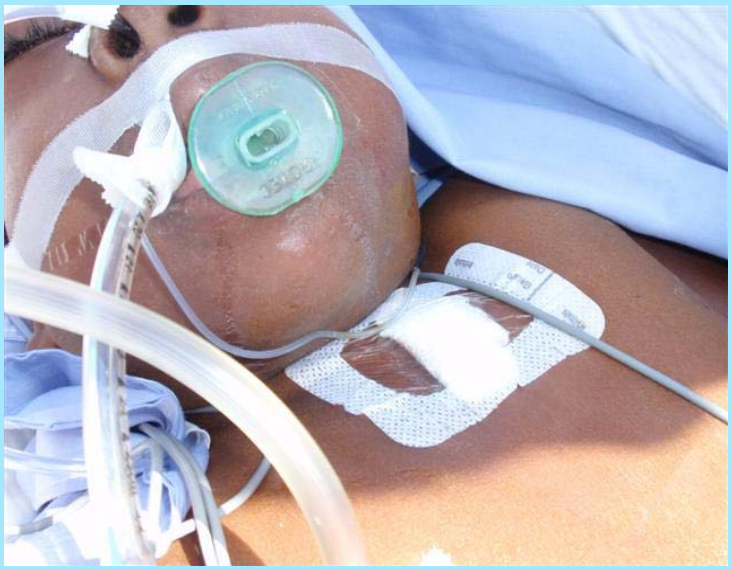
- Open plating performed with sub-optimal implant





Example Operative Cases

- Last evening of trip 6 year old girl brought in with complications related to a botched trach placement, subcutaneous emphysema, respiratory distress
- Required open trachea repair by Dr. Romero
- Manually ambu bagged all night due to no ventilators in all of southern Haiti



Example Operative Cases

Dr. Leger arranged for transport of patient to University of Miami field hospital in Port-au-Prince the following morning

Example Cases

- Young girl with thoracic burst fracture and incomplete paraplegia
- Transferred to University of Miami field hospital

Made possible by…

- VCMC administration, OR, Radiology, Orthopedic department
- Multiple equipment donors: 3M, George Erb PT, CIPO, R&J, Apria, etc.
- Multiple financial donors: Medical Staff Fund, VCMC residents, my Dad's poker buddies, family, friends, etc.

Thank you to the Brazilian Team

Thank you to the VCMC Team

Thank you to the Haitian people

Future of Haiti: 3 months - ?

- Crisis is far from over
- More help is needed
- Rainy season is coming
- Inpatients remain
- New patients arrive daily
- No follow up
- Keep it on US orthopedic agenda
- Planning on sending second team down this month
- Let me know if you're interested

Future of US Disaster Management

- Lesson Learned: we need to be better prepared
- OTA, Military, AAOS
- EWIDP Extremity War Injuries and Disaster Planning hold annual conferences, organizing future programs
- Many have been pushing for these changes for years
- Competing interests
- No consensus

1. Centralized orthopedist database that can quickly mobilize
2. Disaster training prior to deployment
3. Standardization of credentialing
4. Pre-existing arrangements for liability issues
5. Cooperation with military, DOD
6. Guaranteed safety, transport, supplies

What can you do now?

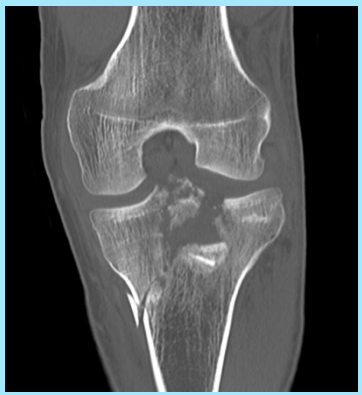
- Multiple disaster medicine training courses available
- Sign up for your local DMAT (disaster medical assistance team) group
- Donate time or resources to colleagues who are volunteering
- Sign up at AAOS, OTA, various university sites for Haiti
- Sign up for orthopedics overseas, SIGN program, etc.

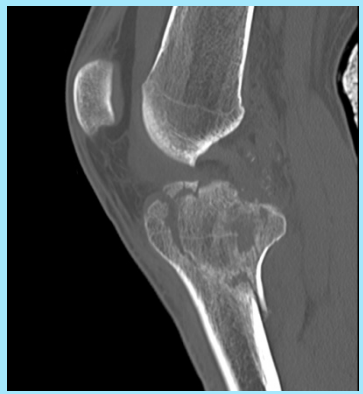
Objectives – California Trauma Call

- History of disaster/trauma care in US
- Organization of trauma care in California
- Distribution of trauma centers
- Who provides orthopedic trauma care?
- EMTALA and other call considerations
- Pros and cons of ortho trauma call
- Referral guidelines to trauma centers: OTA and SERTCC
- Dr. Michael Laird – COA on call survey

What's the big deal?

- Trauma is leading cause of death of people under age 40
- National cost of trauma is approx $200 billion
- 5th most common cause of death in California
- Over 3000 traffic related deaths in California per year



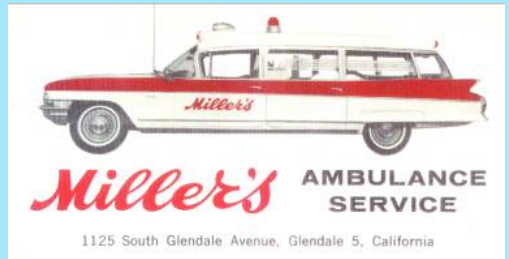


History of US trauma care: EMS

- First motor vehicle accidents
- First volunteer rescue squads seen in the 1920's
- Fire department, funeral homes, hospitals, etc.
- No organization or regulation of services

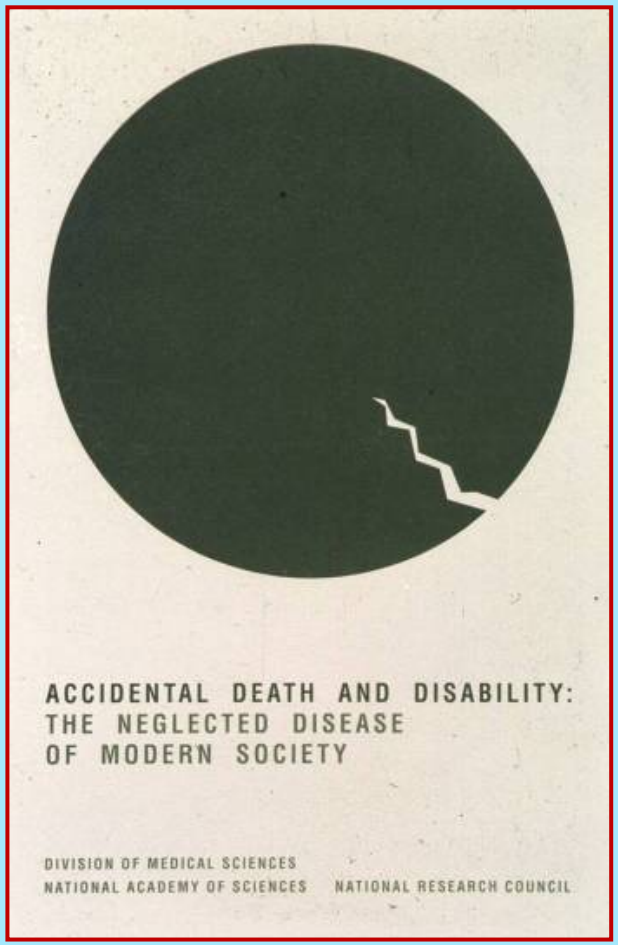
History of US trauma care: EMS

- Eventually gave way to multiple private companies all competing for business
- No dispatch, oversight or regulation

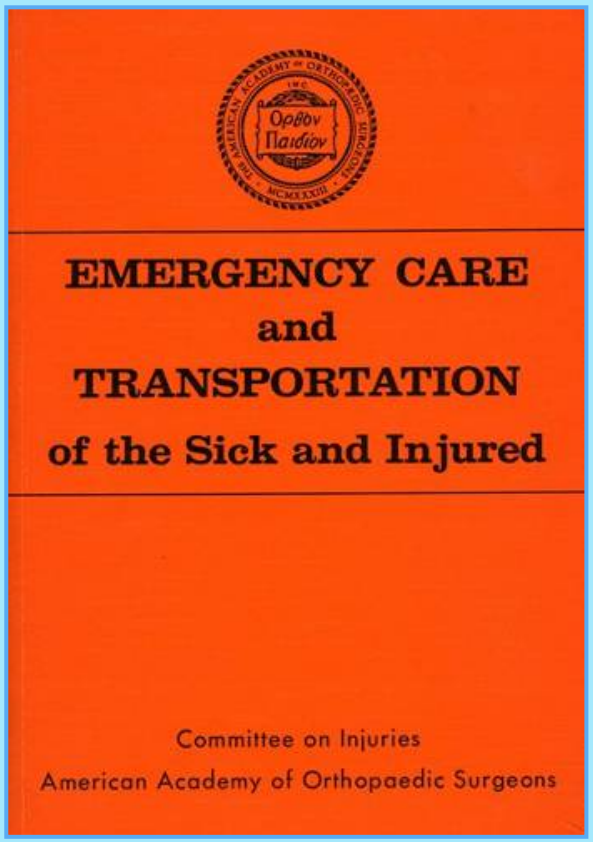


History of US trauma care: EMS

- National Highway Traffic Safety Administration's study, "Accidental Death and Disability: The Neglected Disease of Modern Society", 1966 JoT revolutionized pre-hospital trauma care and put trauma on the national agenda
- Dr. R. Adams Cowley started the first statewide EMS program in Maryland - Shock Trauma Center
- Beginning of modern EMS helicopter transport
- 1970's beginning of Emergency Medicine residency programs
- 1970's ACS began developing regional trauma centers



History of trauma care: EMS



- Orthopedists have been instrumental in the organization of trauma care from beginning
- AAOS was the first to push for EMS training, regulation, and standardization 1970-72
- Revolutionized the pre-hospital care of trauma patients

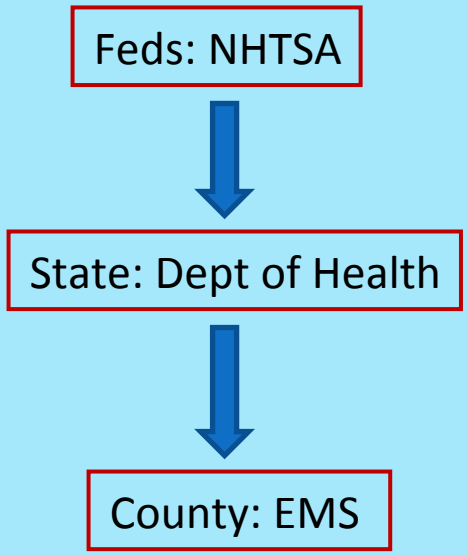
History of US trauma care: ATLS

"when I can provide better care in the field with limited resources than what my children and I received at the primary care facility, there is something wrong with the system and the system has to be changed."

- 1976 Dr. Jim Styner involved in plane crash
- First Advanced Trauma Life Support course in 1978
- 1980 ACS introduced the ATLS across the country and abroad
- Now found in over 50 countries

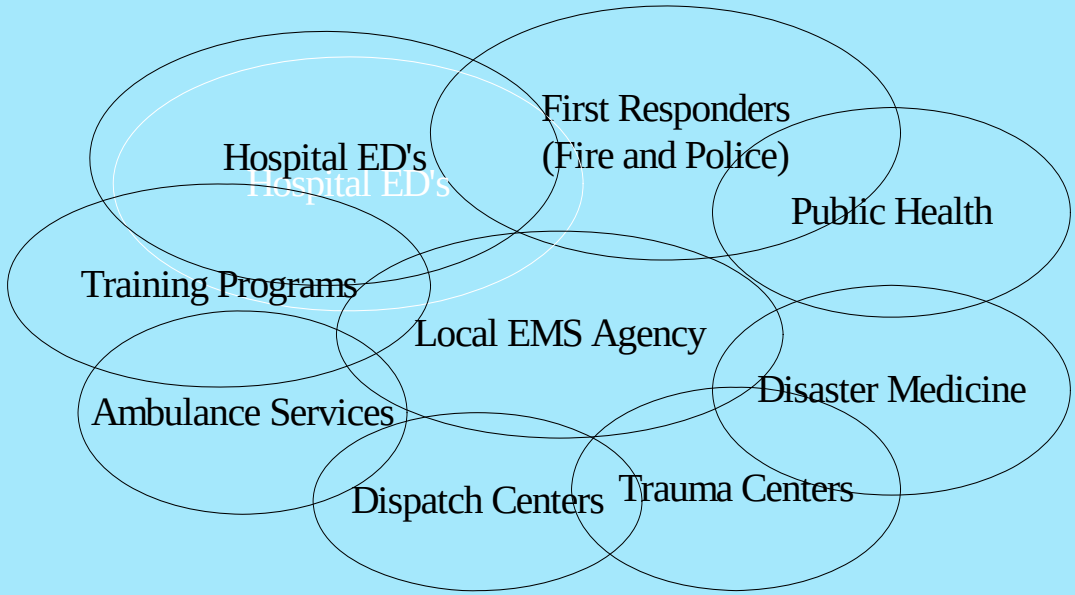
History of trauma care: EMS

- Federal Department of Transportation (NHTSA) now oversees all US EMS systems and sets basic standards
- Each state further regulates their EMS system under their state Department of Health
- Since 1970's California has further divided trauma care by county
- Trauma systems added to the California state Health and Safety code allow for but do not require trauma care systems in every county
- California EMS relies on local, optional trauma care systems… for now



History of trauma care: EMS

- County EMS has multiple responsibilities
- Trains and regulates EMS personnel
- Coordinates ambulance services
- Develops disaster plans
- Designates trauma centers



County EMS

- All counties in California have organized EMS with designated trauma centers or plans for trauma distribution… except Ventura and Solano counties
- Previously no orthopedic traumatologist in county
- Trauma patients brought to closest hospital
- No formal transfer agreements between hospitals or counties
- Many ortho on-call schedules unfilled
- Ortho trauma free for all
- Over past few years Ventura county has been developing their trauma system
- 3 hospitals have started trauma programs and are vying to become designated level II trauma centers

Trauma Centers

- Basic Requirements: Trauma program medical director, nurse coordinator, ED, multi-disciplinary trauma team, specified service capabilities
- In California, trauma centers are designated by the county, they may then become “verified” by the ACS

- Level I – research & teaching facilities
- Level II – all surgical specialties and capabilities with few exceptions
- Level III – some surgical stabilization capabilities
- Level IV – nonsurgical stabilization and transfer

Designated Trauma Centers

- According to CA EMS Mar 2010: 67 total
- 12 level one (7 orthopedic residencies)
- 35 level two
- 11 level three
- 9 level four

Who's providing ortho trauma care?

- You are 
- 46 level II and level III trauma centers are the workhorses of California trauma care
- 16,790 vs. 4,380 nights of call coverage
- Most are staffed by community orthopedists in private practice, no residents
- Less than 20% of all California trauma centers are level one
- 5 of 12 level one trauma centers located in LA county (9.8 million people)
- Many counties have no level I trauma center

EMTALA

- Emergency Medical Treatment and
  Active Labor Act enacted in 1986
- Protects the interests of trauma patients regardless of their ability to pay for care
- Response to the inappropriate transferring of unfunded patients or the refusal to provide care
- Initially directed toward ED's but then extended to include on-call physicians
- Requires hospitals to provide on-call coverage
- Created a conflict because on-call coverage was required, but physician participation optional… so far
- Has teeth: violations incur penalties of monetary fines, termination of staff privileges, or exclusion from Medicare

EMTALA

Coverage issues:

- Requires physicians on call to evaluate and treat emergency patients regardless of the patient's ability to pay for care
- Does not apply to patients without emergency conditions
- Does not include any provisions about follow-up care

EMTALA

Transfer issues:

- Emergency patients must be stabilized prior to transfer
- Receiving institutions that offer specialized services cannot refuse the transfer if the hospital has the capacity to treat the patient
- Gray-zone: what about hospitals with orthopedic departments but no on-call coverage who want to transfer an emergent patient? If receiving hospital refuses transfer, who is in violation?

Ortho Trauma Care Crisis

Internal Trends

- Culture of orthopedics
- Fewer orthopedists wishing to take call
- More sub specialization, less generalists
- Rise of orthopedic surgery centers

External Trends

- Growing number of uninsured patients
- Reimbursement declining
- Malpractice concerns

Why provide ortho trauma care?

PROS

- Build your practice
- More revenue
- Keep up skills
- Fractures are fun
- Responsibility
- Help out colleagues

CONS

- Disrupts your practice
- Financial loss
- Can’t keep up skills
- Fractures can be scary
- Time away from family
- Abused by colleagues

Why provide ortho trauma care?

PROS

Fatalist: “Others will intervene and it will be mandated soon, so we might as well regulate ourselves”

Altruist: “It’s our moral obligation to society”

CONS

Maverick: “We’re not doing anything that other people tell us to do”

Paranoid: “Everyone is out to get us and call is one way they’re stickin’ it to us”

Ortho Call Solutions

Lifestyle:

- Outsourcing for trauma
- Trauma Hospitalists
- Contracting with outside traumatologists
- Physician extenders
- Dedicated OR trauma rooms

Payment:

- Call stipend
- Activation fee
- Reimbursement per OR case at % Medicare rate
- Payment by other hospitals for transfers or “dumping”

Inappropriate Transfers

- Ongoing debate in the discussion about orthopedic trauma care
- Reasons for transfer not always clear
- Rarely quantified
- A Prospective Evaluation of Patients With Isolated Orthopedic Injuries Transferred to a Level I Trauma Center, Goldfarb et al. JOT 2006
- Low complexity trauma cases were more often unfunded
- “Dumping” exists

OTA Referral Guidelines

Approved in 2007
Offers some good insights

- All transfers should be in the best interest of the patient
- Any needed emergency treatments should be provided prior to transfer
- Reason for transfer should be explained to patient
- Prearranged transfer agreements should be in place between hospitals

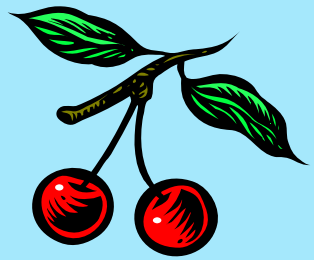
OTA Referral Guidelines

Pre-Planned Transfer Agreements

- Transfers are blind to patient funding, insurance status
- Transfer rules are developed and followed by orthopedists
- Transferring hospital does not have to involve the orthopedist
- Expedites and simplifies the process

No Pre-Planned Agreements

- Transfers are blind to patient funding, insurance status
- Patient should be examined and treated by orthopedist prior to transfer
- "Selective call" is not cool, all emergency patients fall under on-call responsibility



COA Referral Guidelines

- COA is attempting to standardize referral guidelines to assist with transfers of orthopedic patients to higher level of care
- Designed for patients who do not meet other general surgery criteria for transfer

- Created by the South East Regional Trauma Coordinating Committee
- Submitted for your input

COA Referral Guidelines

- High energy pelvic fx
- Displaced 0.5cm acetabular fx
- Irreducible joint dislocation
- Limb injury with N/V compromise (after reduction)
- Compartment syndrome (after release)
- Traumatic Amputation
- Open fx with no ortho
- Displaced femoral & talar neck fx
- Closed fx with severe soft tissue compromise
- Displaced/comminuted periarticular fx (large joints)

<u>Transfer Protocol should include</u>:

- Transfer from orthopedist to orthopedist
- Communicate with receiving general trauma surgeon
- Pelvic binders placed for open book pelvic fx
- Compartment syndrome must be addressed prior to transfer
- Open fx should be I&D'd prior to transfer

Summary

- We are all the fatalist, the altruist, the maverick, and the paranoid
- Orthopedists are trauma leaders
- Communication is the key, preferably before you're faced with the situation: transfers and Hospital Negotiations
- Get to know those surgeons who are referring or receiving your transfers
- Transfer agreements and transfer guidelines can be helpful
- On-call solutions must be uniquely regional

- Keep patient best interest in mind!

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- **NTDB list of designated trauma centers**

Thank you