Perspectives on Upper Extremity Trauma in the USA

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Objectives

- Explain the epidemiology of UE injuries in the US
- Discuss cost of care provision
- Disparity of health cover
- Access and availability of specialized surgery and therapy
- Understand the influence of medicolegal issues
- Explain current protocols

Hospital Stays and costs (2012)
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Most common in-patient Orthopaedic operations in 2012 (1000s)

- Knee arthroplasty: 700
- Laminectomy: 468
- Hip replacement: 468
- Spinal fusion: 450
- Partial excision of bone: 338
- Hip fracture: 276
- Other lower extremity fracture: 188

Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2012

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Age distribution of injury-related ER visits (2010)

- 5-17: 27%
- 18-29: 14%
- 30-44: 28%
- 45-54: 21%
- 55-64: 19%
- 65 and older: 22.1 million ED visits for injury in 2010

Source: Agency for Healthcare Research and Quality (AHRQ), Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey: Ambulatory Surgery and Emergency Department Sample (NHAMCS), 2010

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Cause of injury

- Falls
- MVA
- Struck by object
- Firearms
- Cut by object
- Suffocation/drowning
- 89% injuries are mild
- 90% treated in ER and discharged
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Epidemiology of UE injuries (2009)

- 1:1130 annual incidence
- Sites:
  - Finger: 38.4%
  - Shoulder: 16.8%
  - Forearm: 15.3%
  - Wrist: 15.2%
  - Elbow: 10.5%
  - Arm: 3.7%


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Epidemiology of UE injuries (2009): Type

- Fractures: 29.2%
- Lacerations: 23.3%
- Strains/sprains: 16.2%
- Contusions/abrasions: 14%
- Dislocations: 4.6%

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Annual ER visits for humerus fractures in 2008 (estimation)

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ER visits for forearm and hand fractures (1998)

- 1.5% of all ER visits
- Radius and ulna 44%
- Phalanges 23%
- Metacarpals 18%
- Carpal 14%
- Multiple hand bones 0.6%
- 5-14 yr olds 26%

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Epidemiology of replantations

- 9,407 UE amputations in 3 years
- 1,361 replantations
- 87% male
- Replantation age 36 yrs (0-86)
- Replants by location
  - Thumb 27%
  - Finger 12%
  - Arm/hand 12%

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Replant: location and costs

- Urban hospital 88%
- Large hospital 74%

- Total charge:
  - Replant $42,561 ($784-$596,457)
  - No replant $27,541 ($333-$1,491,333)

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Changes in surgical management

- Increased patient expectations
- Better outcome measures
- Improved implant and fixation techniques
- Example:
  - Clavicle fractures
  - Distal radius fractures

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Disparity in care

- Uninsured, undocumented migrant workers
- Concern about cost
- Need to return to work
- No social support
- Language barriers
- Low income
- Workman’s comp
- Approval delay
- Longer recovery periods

FINDINGS FROM THE COMMONWEALTH FUND 2004 INTERNATIONAL HEALTH POLICY SURVEY, April 2006

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Medicolegal issues in UE

- 40% of members of ASSH have been sued
- Fractures: shoulder and wrist – most common
- Mismanagement: Casting instead of surgery 48%
- Mal/nonunion 27%
- Nerve injury 19%
- Infection 12%
- Major injuries – Rare (2%)
- Decision to not replant (54% of claims)

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Current management: ER

- Most injuries seen in ER and treated by ER staff or residents/PAs
- Primary wound care, casting, splinting
- Closed reduction of fractures; Teaching institutions
- Minor wounds – nail bed repairs, extensor tendon repair
- Specialized centers - simple fracture pinning

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Definitive management: Emergent - middle of night

- On-call orthopaedist
- Fractures with neurological / circulatory compromise
- Compartment syndrome
- Crush injuries, multiple fractures in extremity
- Grade 3 open fractures
- Uncontrolled hemorrhage
- Temporary stabilization
- Replantations, revascularizations - specialist

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Definitive management: Urgent - next morning

- Traumatologist or specialist
- Grade 1, 2 open fractures
- Irreducible fractures/dislocations
- Polytraumatized patients
Definitive management: non-urgent

- Outpatient surgery
- UE specialist
- Usually within a week
- Definitive fixation
- Replacement: shoulder/elbow

Therapy and rehabilitation

- Access: geographical and economical barriers
- Medicare PT and OT Limit: $1,920 each in 2014
- IL Medicaid PT and OT: 20 visits/year combined
- Prior authorization required for reimbursement

Case example