

Slide 1

# Perspectives on Upper Extremity Trauma in the USA

RANDY BINDRA, FRCS  
PROFESSOR, GRIFFITH UNIVERSITY AND GOLD COAST UNIVERSITY HOSPITAL  
SOUTHPORT, AUSTRALIA

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Slide 2

## 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

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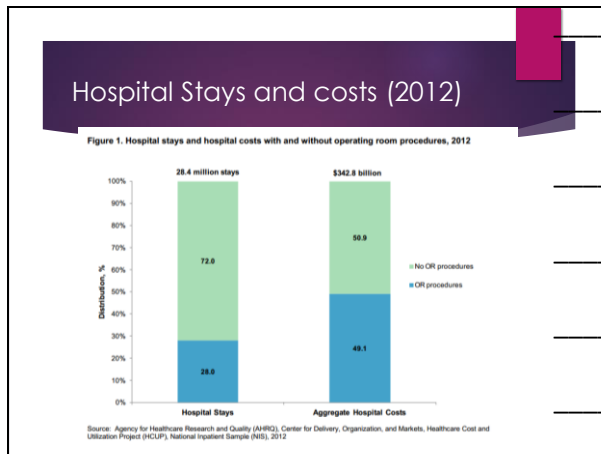
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Slide 4

### 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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Slide 5

### Age distribution of injury-related ER visits (2010)

0-17	27%
18-29	21%
30-44	19%
45-64	20%
65 and older	14%

Source: Agency for Healthcare Research and Quality (AHRQ) Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2010

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Slide 6

### 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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Slide 7

### 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%

Ootes et al, Hand 7:18-22, 2012.

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Slide 8

### 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)

Age	Proximal	Distal	Shaft
0-4	~2,000	~30,000	~2,000
5-9	~5,000	~38,000	~2,000
10-14	~8,000	~15,000	~2,000
15-19	~5,000	~5,000	~2,000
20-24	~3,000	~3,000	~2,000
25-29	~3,000	~3,000	~2,000
30-34	~3,000	~3,000	~2,000
35-39	~3,000	~3,000	~2,000
40-44	~3,000	~3,000	~2,000
45-49	~3,000	~3,000	~2,000
50-54	~3,000	~3,000	~2,000
55-59	~3,000	~3,000	~2,000
60-64	~3,000	~3,000	~2,000
65-69	~3,000	~3,000	~2,000
70-74	~3,000	~3,000	~2,000
75-79	~3,000	~3,000	~2,000
80-84	~3,000	~3,000	~2,000
85-89	~20,000	~3,000	~2,000
90-94	~10,000	~3,000	~2,000
95+	~2,000	~3,000	~2,000

Kim et al, Arthritis Care & Research Vol. 64, No. 3, March 2012, pp 407-414

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### ER visits for forearm and hand fractures (1998)

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

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Slide 11

### 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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Slide 12

### Replant: location and costs

- ▶ Urban hospital 88%
- ▶ Large hospital 74%
- ▶ Total charge:
  - ▶ Replant \$42,561 (\$784-\$596,457)
  - ▶ No replant \$27,541 (\$33-\$1,491,353)

Friedrich et al, *J Hand Surg* 36A:1835-1840, 2011

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Slide 13

### 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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Slide 14

### 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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Slide 15

### 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 (56% of claims)

Matsen FA 3<sup>rd</sup> et al: The quality of upper extremity orthopedic care in liability claims filed and claims paid. J Hand Surg Am 2014;39(1):91-99  
Basilicas N, et al. A single-institution experience of hand surgery litigation in a major replantation center. Plast Recon Surg. 2011 Jan;127(1):284-92

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Slide 16

**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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Slide 17

**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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Slide 18

**Definitive management:  
Urgent - next morning**

- ▶ Traumatologist or specialist
- ▶ Grade 1, 2 open fractures
- ▶ Irreducible fractures/dislocations
- ▶ Polytraumatized patients

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Slide 19

**Definitive management: non-urgent**

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

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Slide 20

**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

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Slide 21

**Case example**

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