

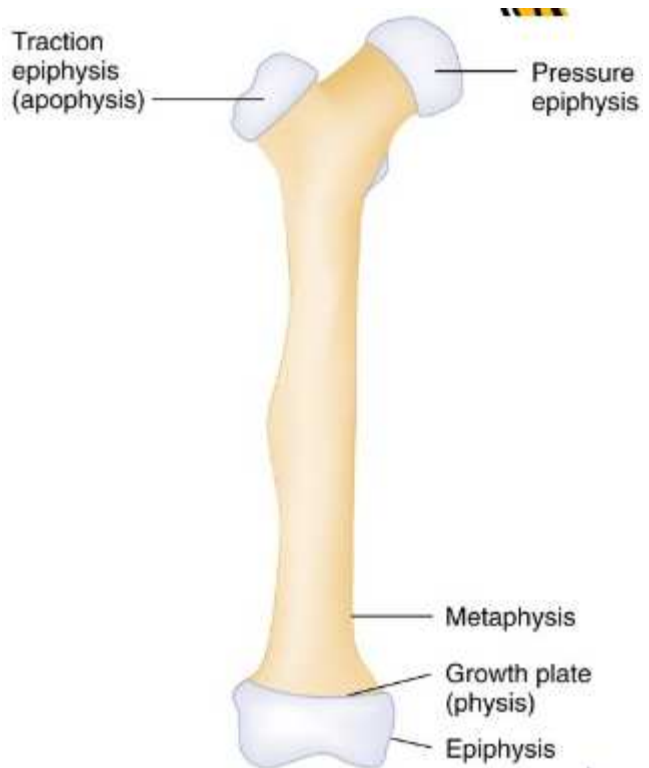
Quality Assurance Conference
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Pediatric Bone vs. Adult Bone

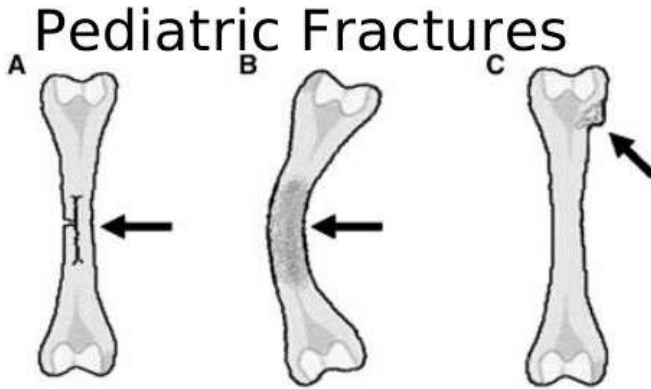
- Highly cellular and porous with more collagen and cartilage
- Reduced tensile strength
- Periosteum is more metabolically active
- Periosteum is thicker and stronger
- Presence of growth plates

Quick Review

- Physis = growth plate
- Metaphysis = column or shaft
- Epiphysis = end



Pediatric Fractures



- A: Greenstick
- B: Plastic Deformity
- C: Torus or buckle

Buckle Fractures

- Most commonly of distal radius
- Low energy injury
- Bony cortex is compressed on one side
- Opposite cortex remains intact



Treatment

- Standard orthopedic treatment is 2-4 weeks in short arm cast
- Variability in length of cast and need for immobilization

Cast vs. Splint

- Randomized, controlled trial
- 87 patients ages 6-15
- Compared physical functioning
- Short arm cast for 3 weeks
- Removable splint to use for comfort only
- Both groups were to avoid contact sports until clinic follow up
- Activities Scales for Kids performance
- Main outcome was score at 14 days

ASKp

- Validated, self-report measurement of childhood physical disability
- Scored out of 100
- Higher score reflects higher functioning
- 30 questions
- 8 added questions specifically for evaluation of upper extremity

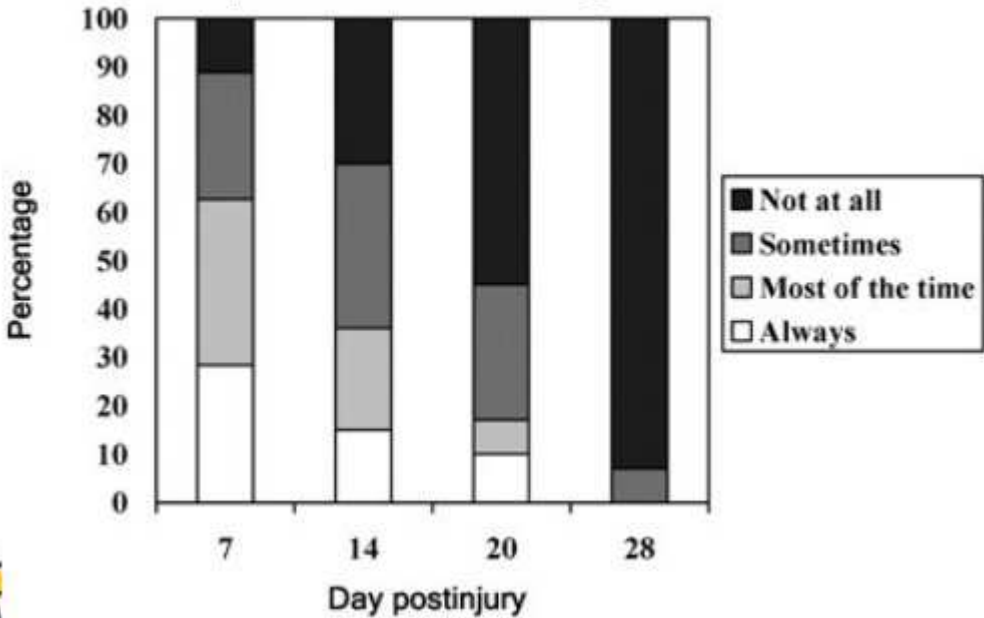
Results

- ASKp and pain scores
- Splint group had significantly higher ASKp score at day 14
- No difference in pain scores
- Daily Activities
- Splinted children had less difficulty with bathing, showering, printing, and grooming
- Return to regular activities by days 20 and 28

ASKp Scores

ASKp Score	Splint Group	Cast Group	Difference	P
Day 7	38	44	-2.70	.331
Day 14	38	45	2.97	.041
Day 20	34	40	-1.72	.091
Day 28	28	37	0.00	.934

Splint Usage



Initial Investigation

- 96 Charts reviewed of distal forearm injuries
- Ages 2-18
- Injuries were seen throughout the Altru system in 2006
- 54 Charts involved a buckle fracture

Results

- 54 Qualifying charts

All confirmed by plain films

39 (72.2%) placed in a short arm cast for 3 weeks

- Further evaluation with another plain film
- 13 then placed in a splint for comfort measures

15 (27.8%) placed in a removable splint

- Treatment time varied
- 8 (14.8%) constant use for 2 weeks
- 4 (7.4%) used for comfort only
- 3 lost to follow up

Current Investigation

84 charts reviewed of forearm fractures throughout Altru system

- Ages 0-18
- 2007-2008
- 35 involved a buckle fracture
- 28 of the distal radius
- 7 of distal ulna

Results

25 () placed in a short arm cast

- Length of time varied from 3-6 weeks
- 24 () of these treated by Orthopedics
- Other treated by Family Medicine

8 () placed in splint

- Length of time 2-4 weeks
- 7 () treated by Family Medicine
- 2 () treated with no cast or splint
- Both treated by Family Medicine

Other Evidence

- Prospective, randomized trial
 - 179 patients with distal radius buckle fractures
 - 81 plaster-of-Paris cast
 - 98 Futura splint
 - Treatment was avg of 2.9 weeks
 - Compliance was good with both treatments
 - All united clinically and showed no loss of position
 - Refracture rate for distal radius/ulna fractures = 2%

Need for Follow up?

- Prospective study of 41 children
 - 12 years old or less with buckle of distal radius
 - Dynacast Prelude slab cast placed on all patients
 - Parents given verbal and written instructions on how to care for and remove splint
 - Splint removed in 3 weeks time
 - Follow up was by phone call and a short survey

Results

Questions	%
Minor problems with cast (loosening)	22
Casts broken and replaced	0
Medical advice sought	10
Difficulty removing cast	0
Satisfied with information	98
Satisfied with treatment and outcome	100

Results

Advantages of Splint

- Easily removed for bathing
- No need for return visit
- Cheaper than casting material
- Can be removed earlier when pain subsides

Conclusions

- Splinting of buckle fractures is safe and acceptable
- Some advantages to casting
- Better functioning, less difficulties with activities, return to activities sooner
- Parental anxiety may be biggest disadvantage
- Follow up is variable

References

- Plint AC, et al. A Randomized, controlled trial of removal splinting versus casting for wrist buckle fractures in children. *Pediatrics*. Jan 19, 2007. pp691-697.
- Solan MC, et al. Current management of torus fractures of the distal radius. *Injury*. Oct 2001. pp503-505.
- Davidson JS, et al. Simple treatment for torus fractures of the distal radius. *Journal of Bone & Joint Surgery*. Nov 2001. pp1173-1175.
- Symons S, et al. Hospital versus home management of children with buckle fractures of the distal radius. *The Journal of Bone & Joint Surgery*. July 2000. pp556-560.
- Carson S, et al. Pediatric upper extremity injuries. *Pediatrics Clinics of North America*. 2006. pp 41-67.