



Salter-Harris fracture classification system grades pediatric fractures that involve the **growth plate** or “**physis**”.

## EPIDEMIOLOGY

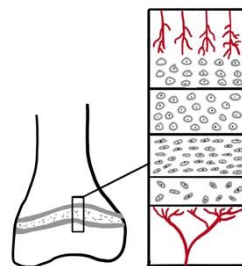
- Represents ~15-30% of all bony injuries in children.
- Most common in upper extremities (i.e., distal radius, phalanges, etc)
- Occurs during the **growth spurt**.
- Males > females**.
- Weak physis less resistant to force/tension than strong ligaments.
- Females are affected at 11-12 yrs vs. males are affected at 12-14 years.
- Type II is most common (75%)**.

## PATHOPHYSIOLOGY

- Physis** = weak hyaline cartilage between the epiphysis & metaphysis that ossifies as children grow.
- Physeal fractures occur in the **zone of provisional calcification**; but may cross several zones depending on injury type or external force.

- Commonly affects the **hypertrophic zone**.
- Epiphysis blood supply becomes compromised, causing growth arrest.

**Physis zones:** metaphysis → epiphysis



- Zone of provisional calcification
- Hypertrophic zone
- Proliferative zone
- Germinal zone

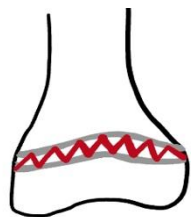
## PHYSICAL EXAM

- Localized joint pain & swelling.
- Focal tenderness over physis.
- May mimic ligament injury (laxity, ↓ end-feel).

## DIAGNOSIS

- Imaging:**  
X-ray

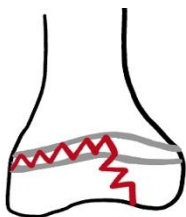
**COMPLICATIONS:** bone deformity & limb length discrepancy may occur from longitudinal growth arrest.



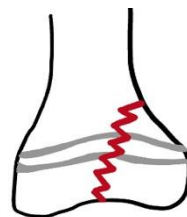
Type I  
**S**pans physis



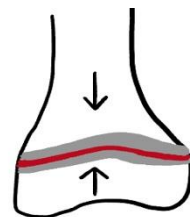
Type II  
**A**bove physis



Type III  
**B**eLow physis



Type IV  
**T**hrough physis



Type V  
**C**Rushed physis

Rotating/twisting force

Compression force

## MANAGEMENT

**Goals:** (1) reduce, (2) immobilize, and (3) maximize range of motion/strength with physical therapy.

**Type I & II:**  
Closed reduction, casting, or splinting.  
\*\*Some cases may require surgical reduction.\*\*

**Type III & IV:**  
Open reduction & internal fixation.  
\*\*Avoid crossing the physis.\*\*

**Type V:**  
Emergent ortho consult, due to potential growth arrest!

**Amount of injury to growth plate and possible growth disturbance increases from Type I to V.**

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