

Patellofemoral considerations in the growing patient

JEANA LYN SUMMERS, DO

PEDIATRIC ORTHOPEDIC SURGEON

ORTHOPEDIC + FRACTURE SPECIALISTS, PORTLAND, OR

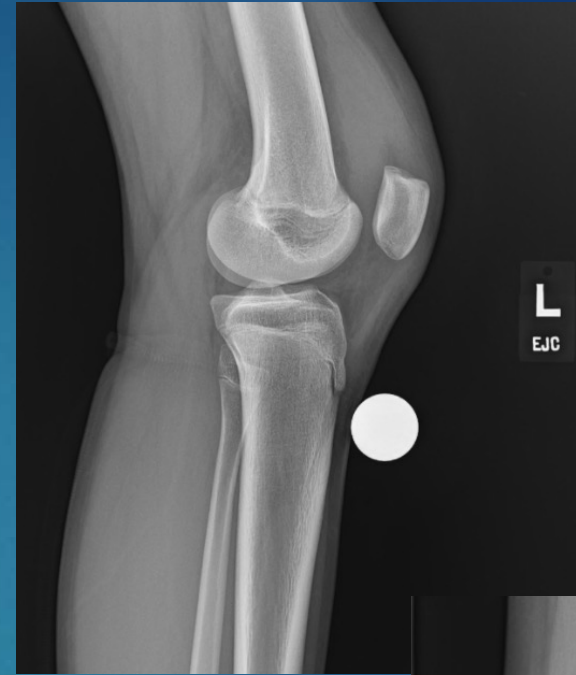
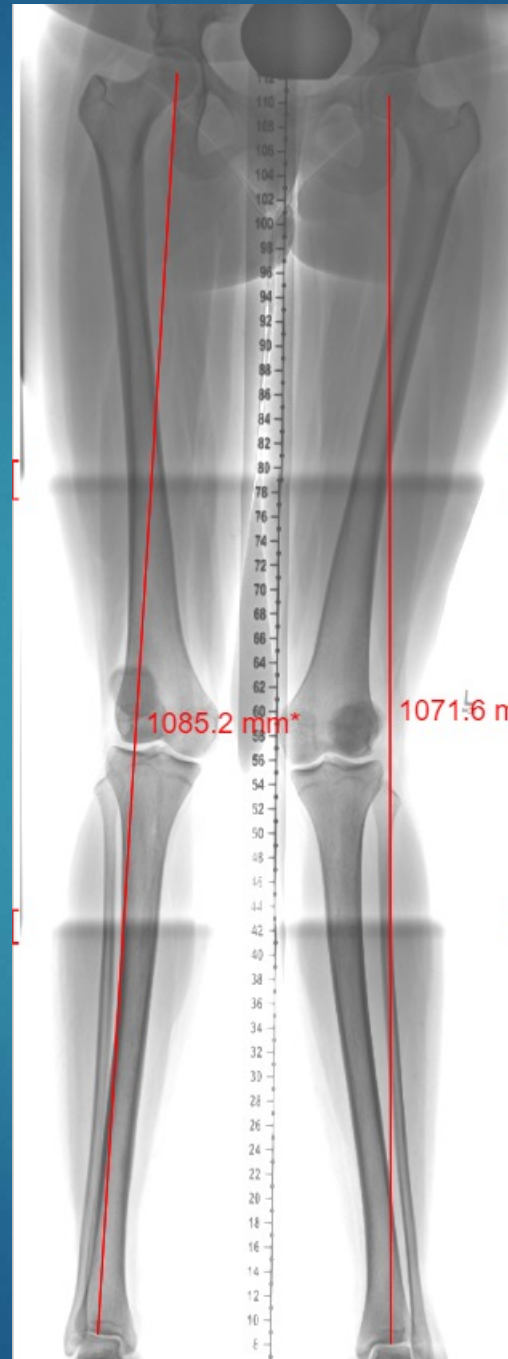
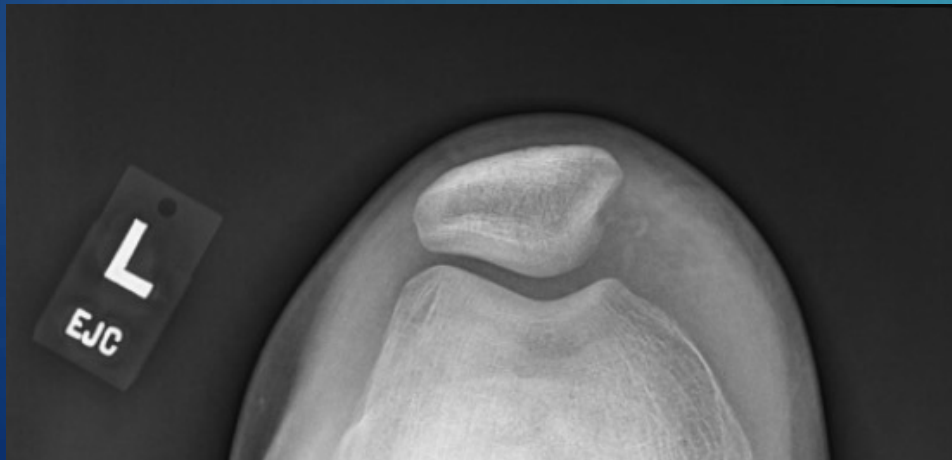
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Disclosures

▶ None

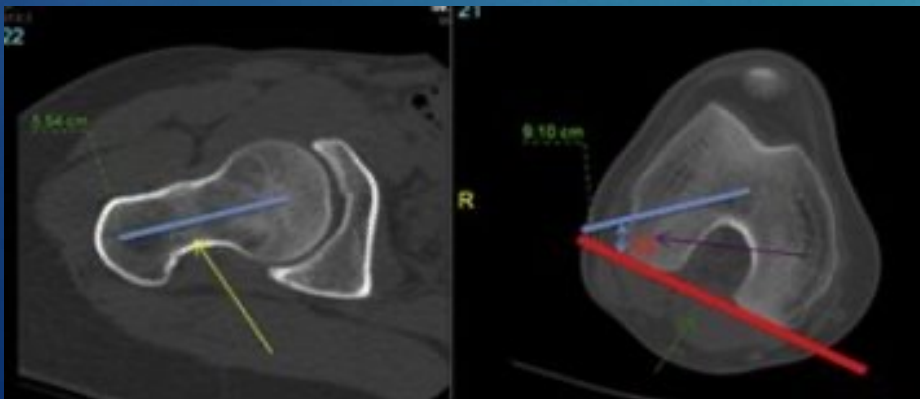
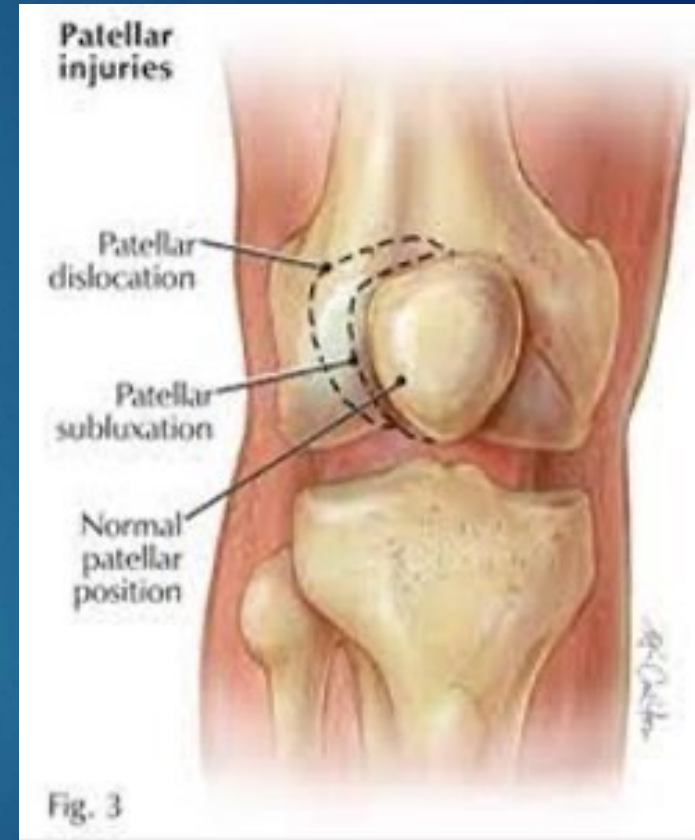
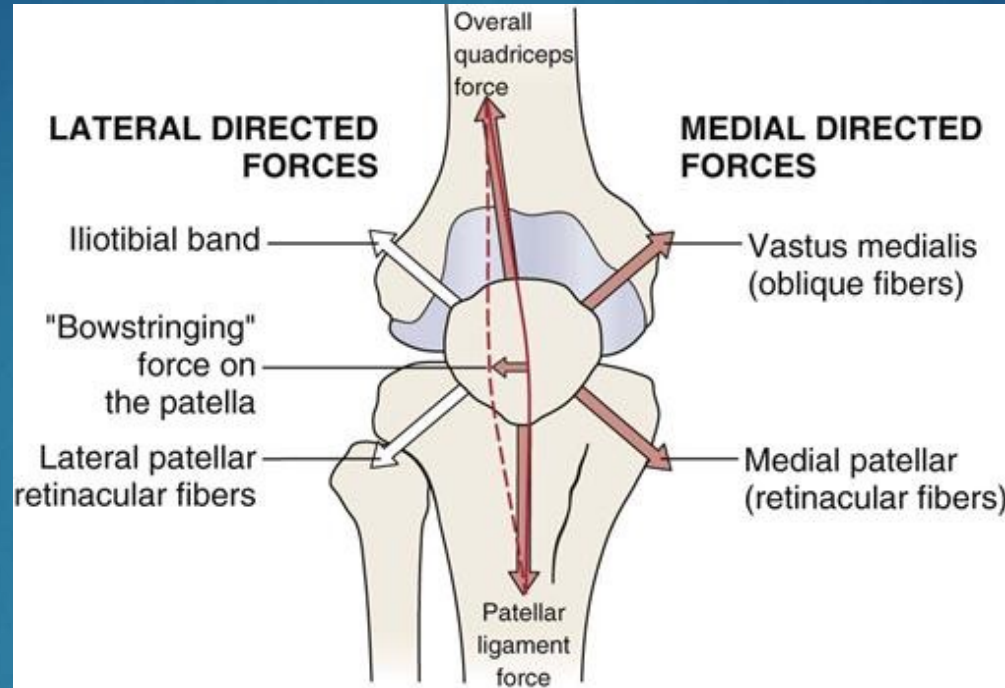
- ▶ Anatomic differences
- ▶ Muscle control
- ▶ MRI findings



▶ Anatomic differences

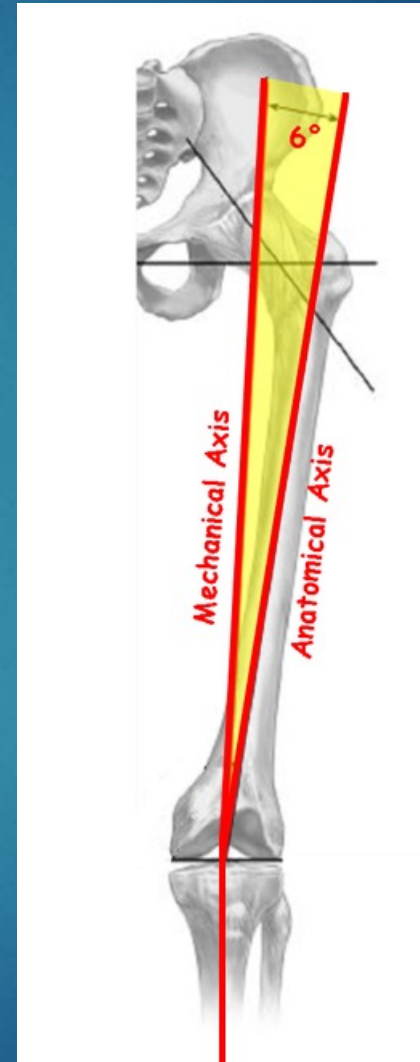
▶ Muscle control

▶ MRI findings



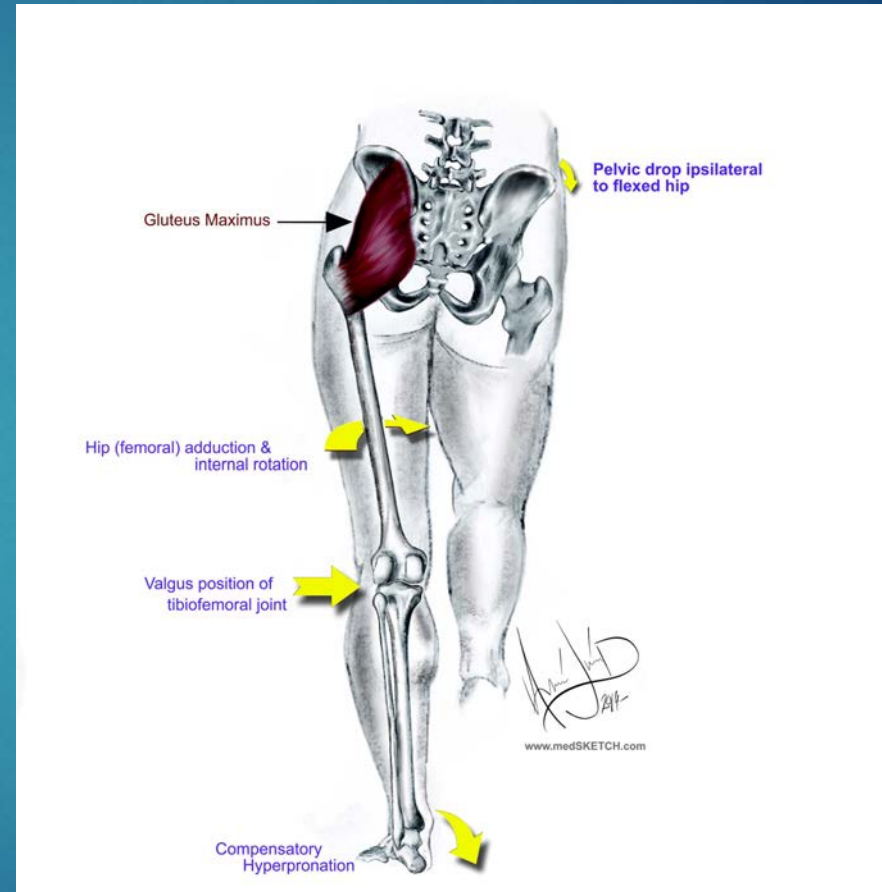
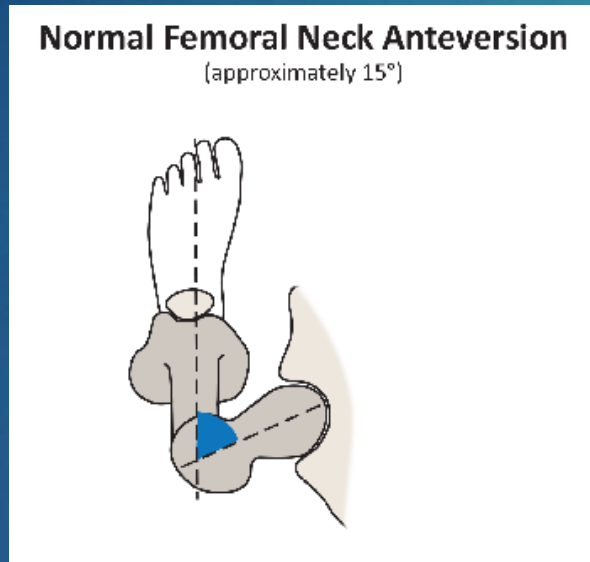
Mechanical versus Anatomic Axis

- ▶ Mechanical axis
 - ▶ COR femoral head to center of ankle joint
 - ▶ Should pass through center of knee
 - ▶ Line of force of axial mechanical load in static weightbearing
- ▶ Anatomic axis
 - ▶ Passes through midpoint of diaphysis



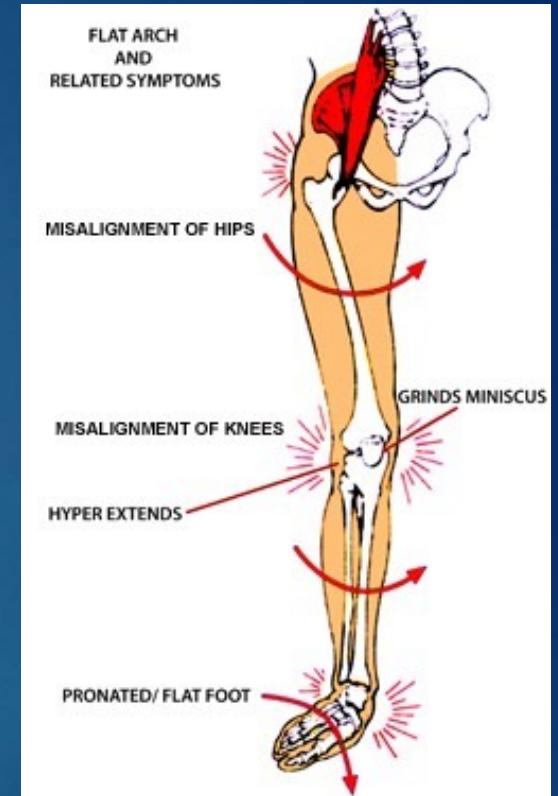
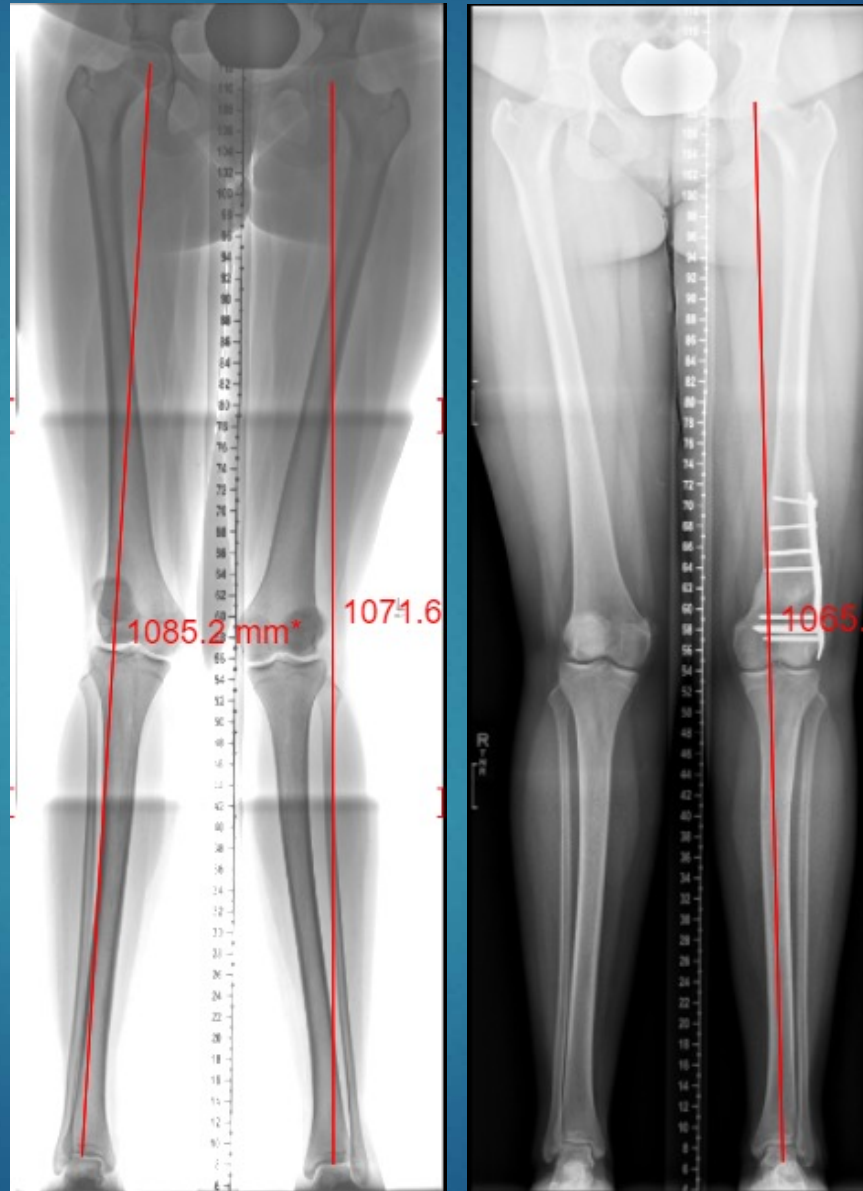
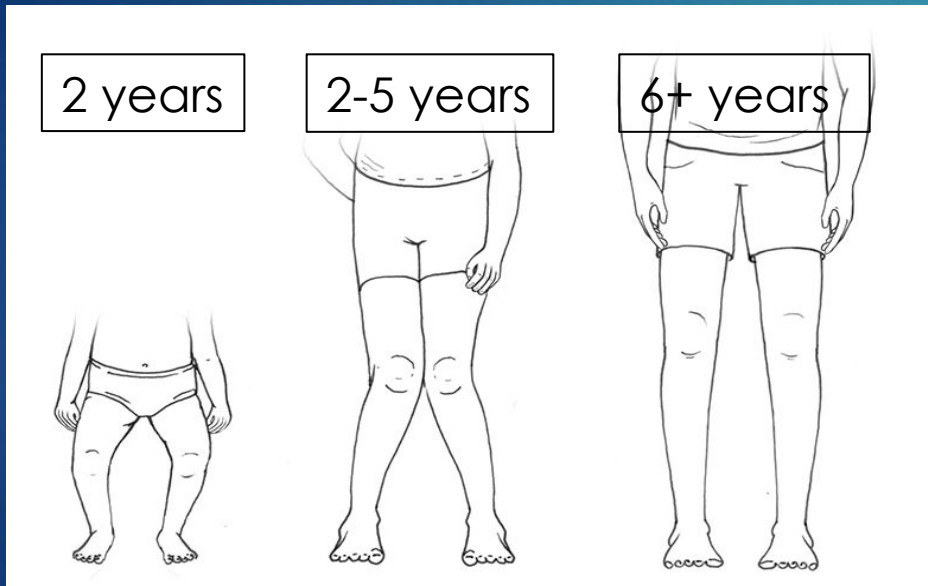
Femoral Anteversion

- ▶ Relation to trochlear groove
- ▶ Muscular control



Genu Valgum

- ▶ Genu Valgum
 - ▶ Mechanical axis Line passes lateral to knee joint

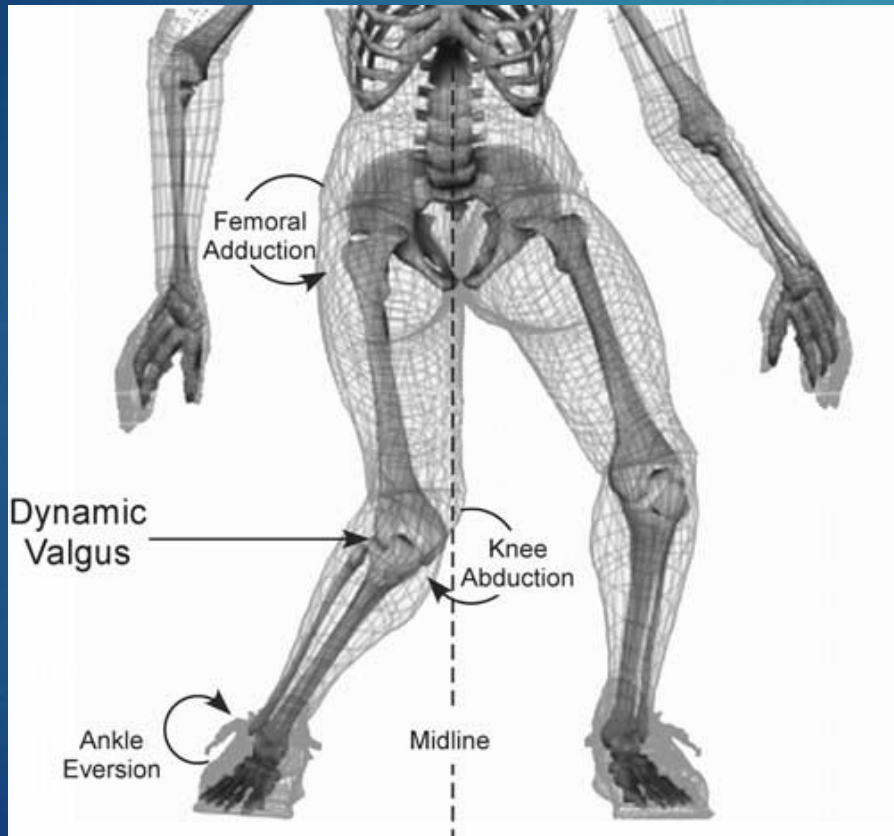


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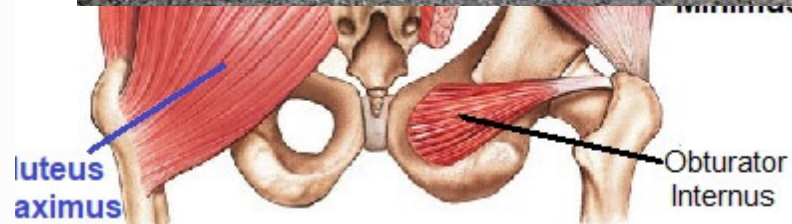
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Muscular considerations

- ▶ Quads
- ▶ Glutes



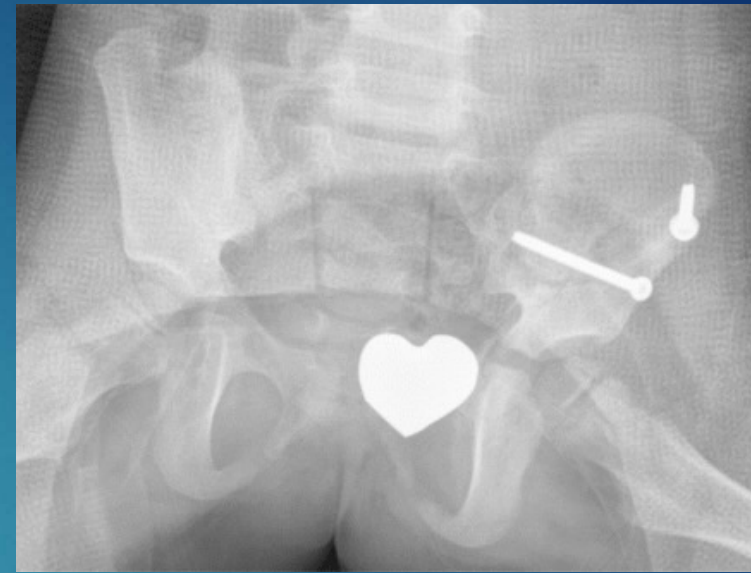
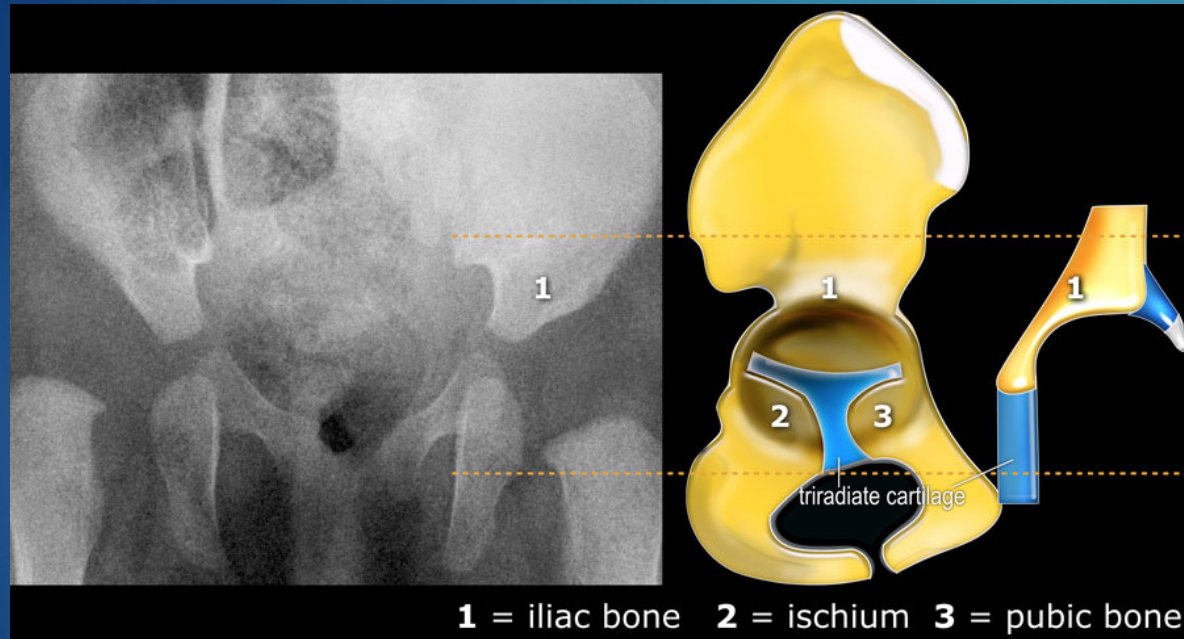
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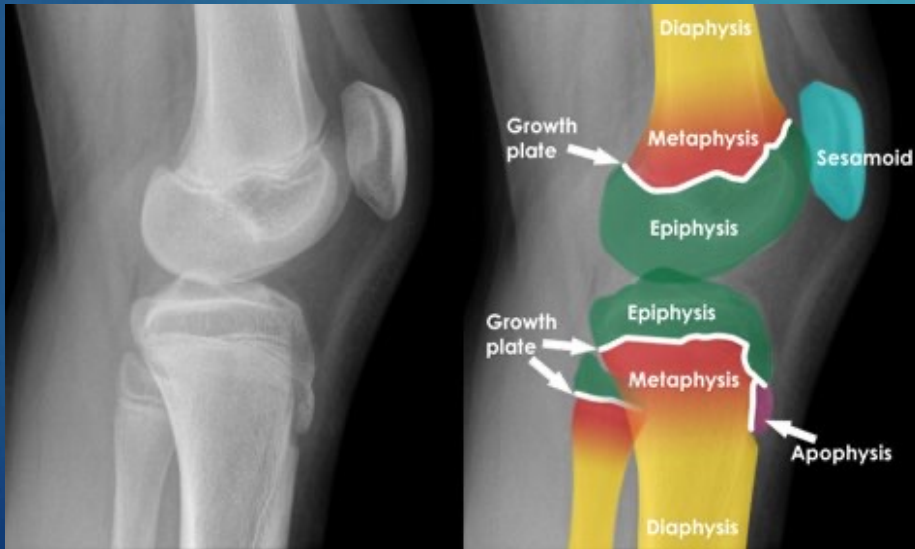
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Hip dysplasia and triradiate cartilage

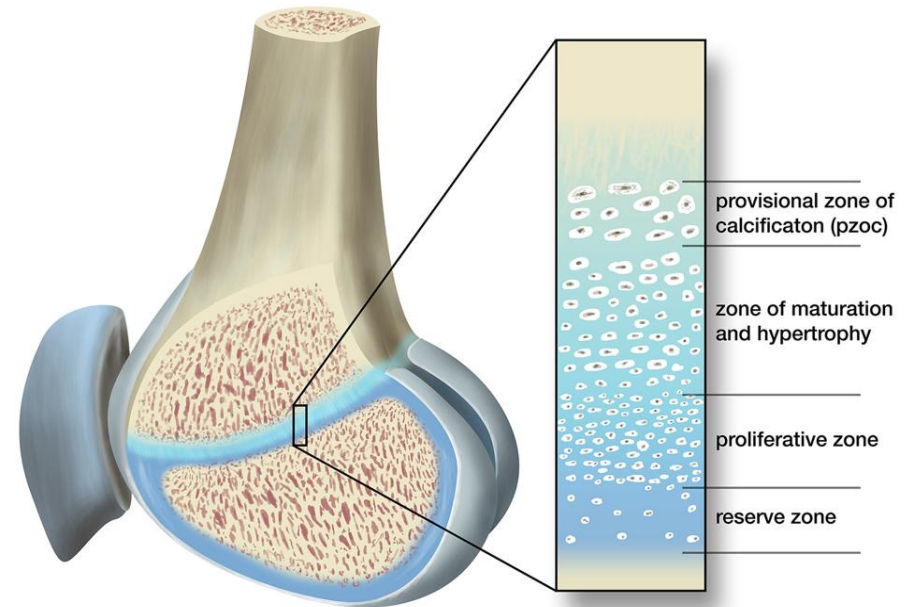


Distal femoral physis

- ▶ Contributes to 70% of femoral growth (approximately 1cm/year)
- ▶ Patella sits anterior, suspended within the musculature



Physeal anatomy



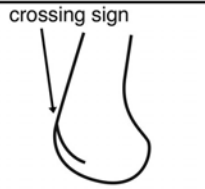

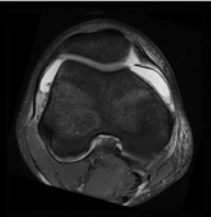

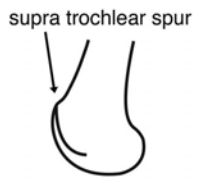

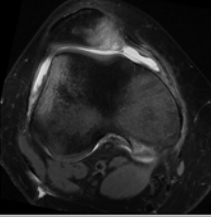

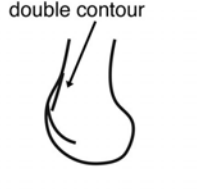

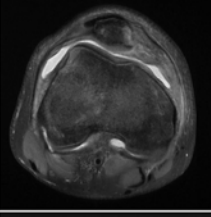

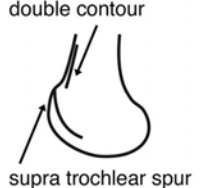

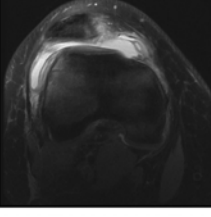

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Trochlear dysplasia

► Dejour classification

	Radiographic Dejour		MRI Dejour	
Type A	crossing sign 			shallow trochlea >145° 
Type B	supra trochlear spur 			flat trochlea 
Type C	double contour 			lateral convexity medial hypoplasia 
Type D	double contour supra trochlear spur 			cliff 

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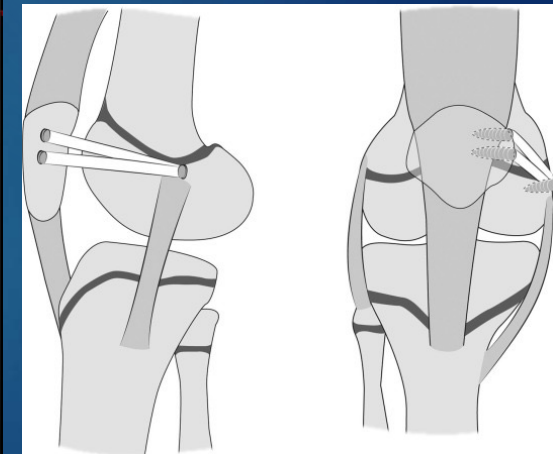
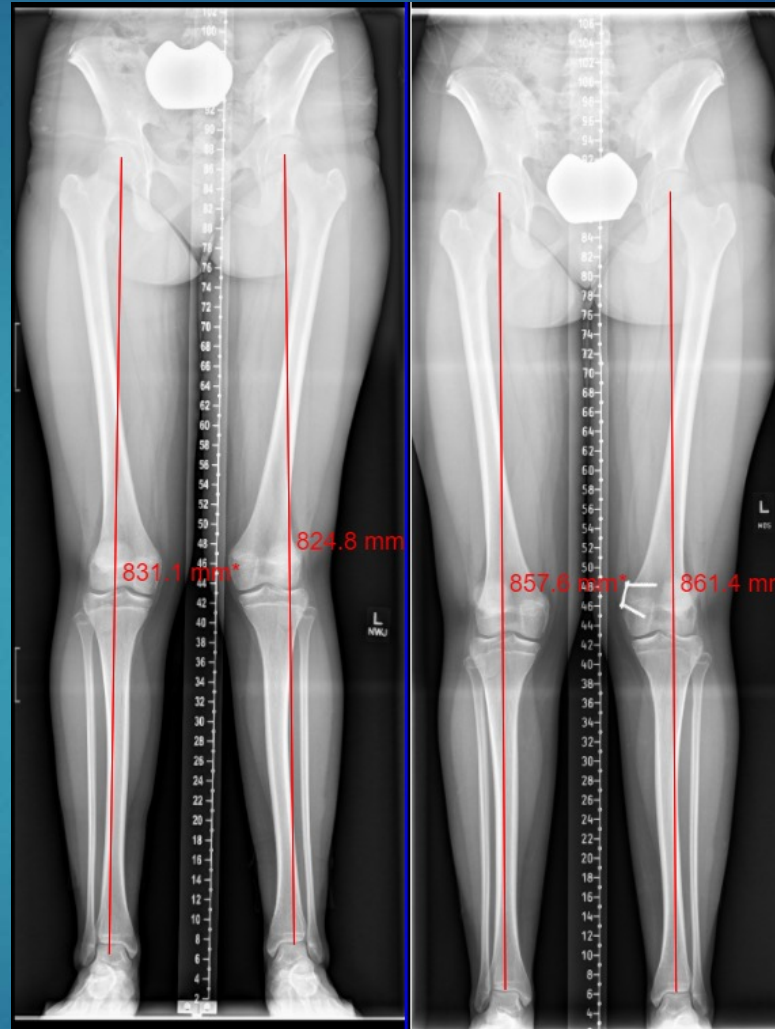
Treatment Options

- ▶ Conservative
- ▶ Activity/sports recommendations
- ▶ PT
 - ▶ Gluteus strengthening
 - ▶ Strengthening of VMO
 - ▶ Stretch IT band
- ▶ Bracing
 - ▶ Patellar strap
 - ▶ Lateral buttress
 - ▶ Orthotics



Treatment

- ▶ Surgery – respect the physis
 - ▶ Genu valgum:
 - ▶ Hemiepiphysiodesis
 - ▶ Lateral femoral opening wedge osteotomy
 - ▶ Patellar subluxation/lateral dislocation
 - ▶ Medial imbrication
 - ▶ MPFL reconstruction
 - ▶ +/- knee scope with lateral lengthening
 - ▶ +/- cartilage evaluation with repair
 - ▶ Patella alta
 - ▶ Patellar plication
 - ▶ tibial tubercle osteotomy
- ▶ Goals are to stabilize patella within condyles and limit further cartilage injury and early osteoarthritic changes



Resources

- ▶ Developmental Dysplasia of the Hip. U/S Examination. 2017 <https://radiologyassistant.nl/pediatrics/hip/developmental-dysplasia-of-the-hip-ultrasound>
- ▶ Distal femoral fractures in children. 2022 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9069856/>
- ▶ Femoral Osteotomy: An Overview. Buly, MD. 2015 https://www.hss.edu/conditions_femoral-osteotomy-overview.asp
- ▶ The Gluteal-Knee Connection: part Two. Morgan. 2014 <http://drmorgan.info/blog/gluteal-knee-connection-part-two/>
- ▶ Knee Alignment issues. Andrea Collo. 2012 <https://andreacollo.wordpress.com/2012/07/03/knee-alignment-conditions/>
- ▶ Medial Patellofemoral Ligament Reconstruction Using Hamstring Autograft in Children and Adolescents. Ladenhauf, MD. 2013 <https://www.sciencedirect.com/science/article/pii/S2212628713000078>
- ▶ Orthofix. Basic Considerations of Deformity Correction: Anatomical and Mechanical Axis. 2021 <https://abs.orthofix.it/blog/basic-considerations-of-deformity-correction-anatomical-and-mechanical-axis/#:~:text=The%20mechanical%20axis%20is%20always,sagittal%20plane%2C%20as%20in%20femur.>
- ▶ Patella instability in the skeletally immature patient: pearls for surgical treatment. Andrish. 2018 <https://aoj.amegroups.org/article/view/4316/4912>
- ▶ Patellar Instability in Pediatric Patients: Review of Lit. Familiari. 2021 <https://www.mdpi.com/2673-4036/1/4/19>

Thank you!



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