

**Indications for Femoral Anteversion (aka “CT Scanogram”, “Tibial Torsion”)**

- THIS IS A VERY LIMITED STUDY.
- The primary purpose of this scan is to allow the radiologist to measure the angle of rotation of the femoral necks relative to the femoral condyles, bilaterally.
- A secondary measurement is femoral lengths, made by calculating the difference in table position at the ends of the bones.
- (Similar measurements can also be made of the tibias, if specifically clinically requested.)

**Other Leg Length Imaging Studies**

**Radiographic Scanogram**

- This is a radiographic study in which coned-down images of BOTH HIPS, KNEES, & ANKLES are shot on a single conventional-sized film (or CR Plate) with a radiopaque ruler in place.
- The sole purpose of this study is to measure leg-lengths.
- Currently at the UW this study is shot CR, and read soft-copy by the radiologists on the ALI.

**TVO** (illustrated to the right→)

- This is a radiographic study in which both legs are imaged in their entireties, from hips to ankles, on a single long film, using a “scoliosis” cassette. No ruler is used.
- Typically, these are used by Orthopedic Surgeons for planning purposes.
- Currently at the UW, because of the need for a long continuous image, this is one of the few imaging studies still being shot primarily on film.

**Positioning on CT Table**

- Patient Supine, Feet First, legs flat on the table.
  - ✓ No cushions/wedges under legs/feet!
- Legs as close together as possible.
  - ✓ Consider taping feet together (or using foot-board).
  - ✓ Consider taping knees if extra stability is needed.

**Scout**

- Single VERY LONG scout, AP plane only.
  - ✓ Scout must extend above Hips and below Ankles!

**CT Scanning Parameters**

- Helical images, 5.0mm Thick, 5.0mm Intervals
- Acquire 3 small slabs covering both: Hips/Knees/Ankles
  - ✓ Just above Femoral Heads, thru Lesser Trochanters
  - ✓ Just above Femoral Physis, thru Tops of Tibias
  - ✓ Just above Syndesmosis, thru Talar Domes

**2D Reformats**

- None

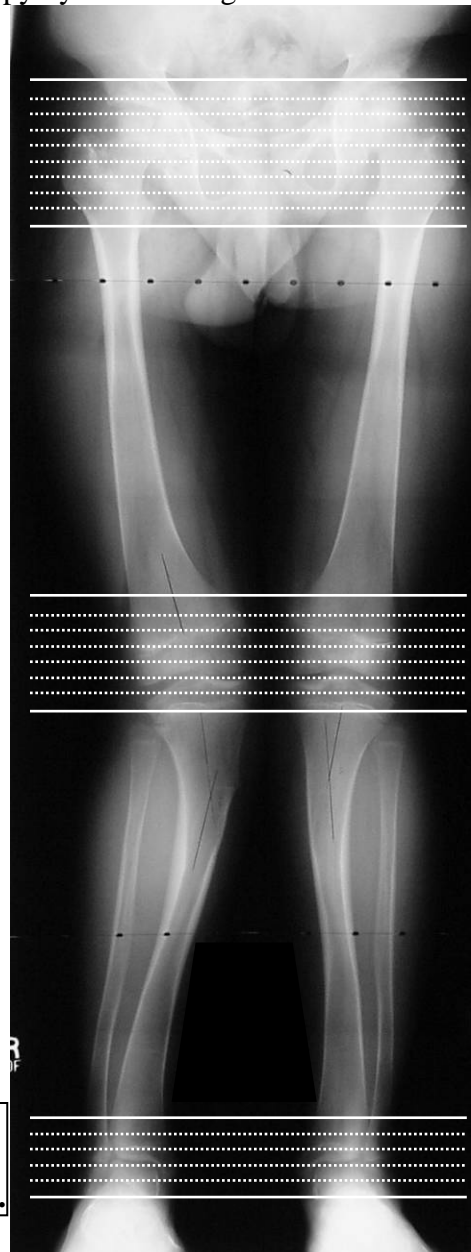
**Filming**

- None

**What to Send to ALI**

- Everything: θAP Scout  
θAll source images

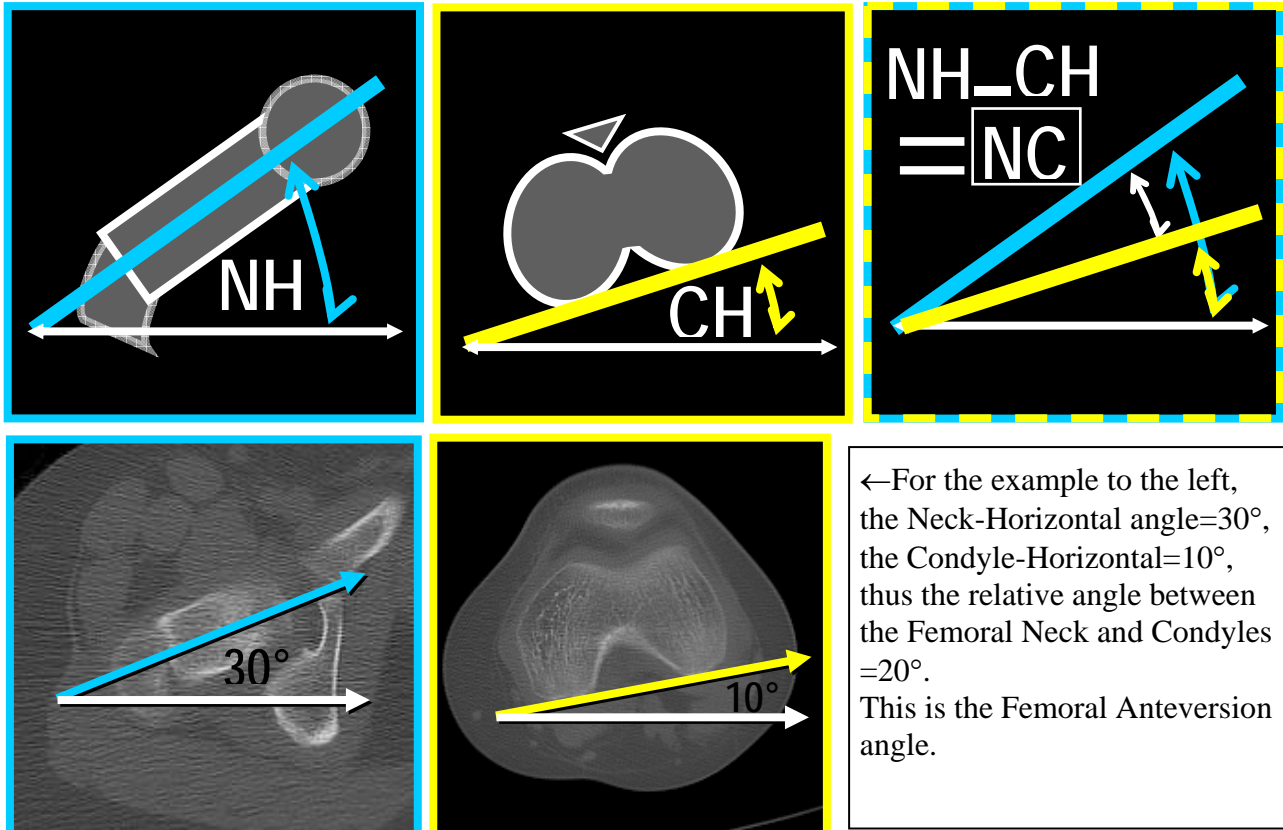
**Note: Scan Ankles  
ONLY if Tibias are  
clinically requested.**



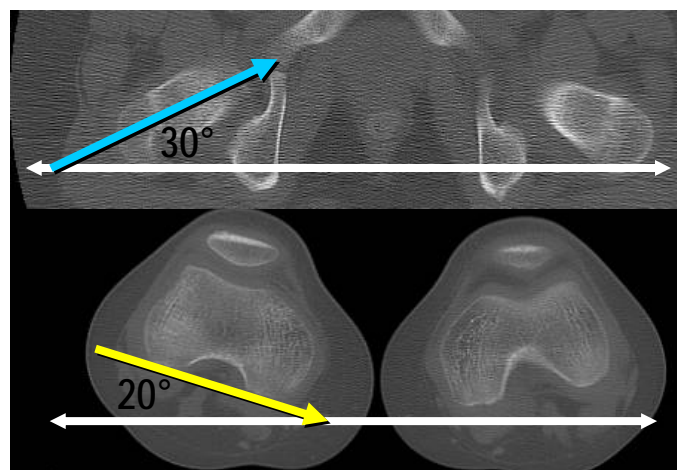
**Measurements To Be Made off of a CT Scanogram**

Femoral Anteversion

- MEASURE RIGHT AND LEFT SIDES INDIVIDUALLY
- Find the slice that best reveals the alignment of the femoral neck.
- Measure the Neck-Horizontal Angle (NH).
- Find the slice that best reveals the alignment of the femoral condyles.
- Measure the Condyle-Horizontal Angle (CH).
- Calculate the angle of the Neck *relative to* the Condyles (NC=NH-CH).



- In cases when the femoral condyles are *internally rotated* (as shown right→), then the CH angle is *ADDED* to the NH angle. (In the example to the right,  $NC=NH+CH=30°+20°=50°$ ).
- The key to visualizing the Anteversion angle is to imagine rotating the femoral shaft such that the Condyles are straight horizontal (CH=0). The Anteversion angle is now equal to the angle between the femoral neck and horizontal (NH).



Femoral Length

- MEASURE RIGHT AND LEFT SIDES INDIVIDUALLY
- Determine Table Positions at tops of femoral heads and bottom of femoral condyles.
- Report difference to the nearest 0.5cm.