

## **INSTRUCTIONS FOR USING THE KNEE SOCIETY RADIOGRAPHIC EVALUATION FORM**

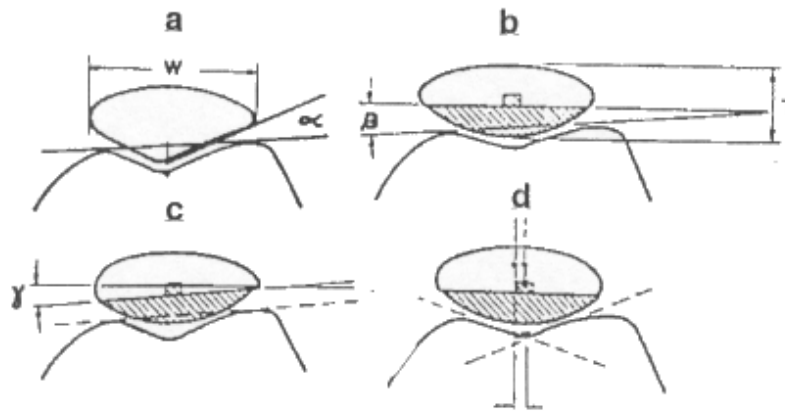
Routine standing and recumbent anterior-posterior, lateral, and skyline patellar roentgenograms are made pre-operative, at time of hospital discharge post-operative, and at each follow-up visit.

The skyline patellar views use the technique suggested by Laurin et al (3) except the knees are flexed 60 degrees instead of twenty to thirty degrees as recommended by Laurin. This radiographic positioning is similar to the technique described by Merchant et al (4) except the radiographic beam is directed cephalad instead of towards the foot. In addition the knee may be more flexed (45-60 degrees) compared to forty-five degrees recommended by Merchant. In both the Laurin and Merchant views the radiographic beam is perpendicular to the radiographic cassette.

Three foot long cassette roentgenograms at a six foot tube to film distance with the patient standing are not routinely made except when unusual deformity or special knee alignment problems are anticipated.

Roentgenographic data is recorded using the Knee Society total knee evaluation and scoring system (1) pre-operatively and post-operatively on the latest set of films made for each knee. All linear measurements are made with a 15% magnification ruler in millimeters. Angle measurements were recorded in degrees.

Additional radiographic measurements using the general systems of Gomes et al (2) and Laurin et al (3) are made of the patella in the skyline views pre-operative and post-operatively. These measurements are patellar thickness, width, tilt, medial-lateral displacement, and the angle of the patellar prosthesis in patellar bone.



	Pre Op	Post Op	p value
W :PATELLAR WIDTH			
$\alpha$ :AB. PATELLAR TILT			
$\beta$ :PATELLAR TILT $> 5^\circ$			
T :PATELLAR THICKNESS			
$\gamma$ :PROSTHESIS-BONE ANGLE $> 5^\circ$			
d :LAT. PAT. PLACEMENT			

Figure 1a shows the patellar tilt angle ( $\alpha$ ) for the unsurfaced patella, pre and post-operative using the evaluation system of Laurin et al (3). The patellar tilt angle for the pre-operative or unsurfaced patella is formed by a line drawn across the anterior limits of the femoral condyle or prosthesis in the skyline view and a line connecting the apex of the patellar articular surface (point where medial and lateral patellar facets join) with the lateral edge of the lateral patellar facet. If the angle is positive as indicated in the drawing, the patellar angle is considered normal. If the angle is zero or reversed, patellar tilt is considered abnormal. Subluxation and dislocation are also indicated by this measurement, because a low or reversed angle indicates subluxation and displacement. If the reversed angle is high, complete dislocation will be present.

Figure 1b measures patellar thickness (T) pre and post-operatively as the vertical distance from the anterior cortex of the patella to the depth of the femoral patellar sulcus. Patellar tilt ( ) after a patellar prosthesis has been implanted is the angle between a line drawn connecting the anterior limits of the condyles and a line drawn through the prosthesis bone-interface.

Figure 1c measures the patellar prosthesis-bone angle ( ) at the intersection of a line drawn through the equator of the patellar bony remnant and a line drawn through the patellar prosthesis-bone interface.

Figure 1d measures the medial-lateral position of the bony patella pre and post-operative and the prosthesis-bone complex post-operative patellar replacement. This measurement is the horizontal distance between two vertical lines perpendicular to a line drawn across the femoral condyles. One line is formed by the midpoint of the bony patella and the other line by a point in the depth of the femoral patellar sulcus. The later point can be estimated by visual inspection or by the intersection of the medial and lateral tangent lines of the femoral condyles converging in the depths of the sulcus.

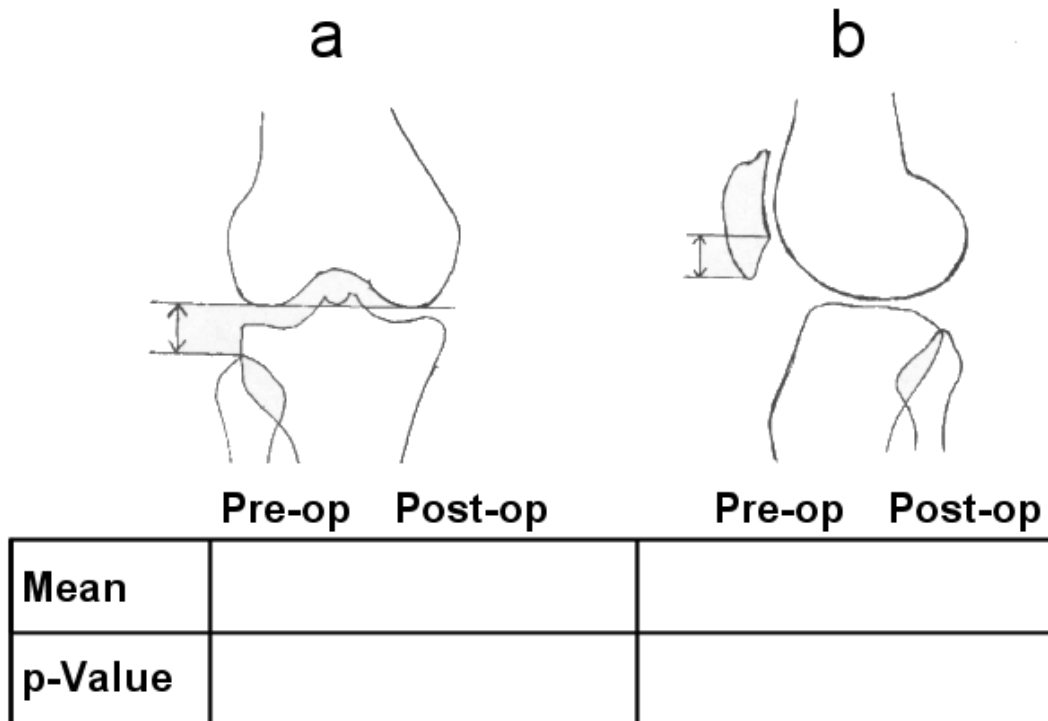


Figure 2a measures the position of the joint line by the shortest distance on a recumbent anterior-posterior film between the tip of the fibula and a line drawn between the two subchondral plates of the femoral condyles pre-operative and postoperatively using the femoral metal component.

Figure 2b measures the position of the patellar prosthesis in the superior-inferior direction post-operative. This measurement is made between the most inferior bony point of the patella and a horizontal line from the distal point of the articular surface pre-operatively and the most distal point of the patellar prosthesis post-operatively. The distal point of the replaced patella is identified by the cement margin or in some cases by the outline of the polyethylene patellar prosthesis.

**REFERENCES:**

1. Ewald, FC: The Knee Society total knee arthroplasty roentgenographic evaluation and scoring system. Clin Orthop 248:9-12, 1989.

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3. Laurin CA, Levesque HP, Dussault R, Labelle H, Peides JP: The abnormal lateral patellofemoral angle. J Bone and Joint Surg 60-A:55-60, 1978.

4. Merchant AC, Mercer RL, Jacobsen RH, Coal CR: Roentgenographic analysis of patellofemoral congruence. J Bone Joint Surg 56-A:1391-1396, 1974.