Objective: Electrical stimulation of the tibial nerve (N) is frequently used to elicit the soleus muscle Hoffman Reflex (H-Reflex). However, difficulties with identifying tibial N position, limits optimal H-Reflex stimulation and evaluation. Therefore, the purpose of this study was to evaluate the anatomical variability of the tibial N within the popliteal fossa. Design and Settings: A descriptive cadaveric study was performed. Knee angles from zero to ten degrees were acceptable for inclusion when noticeable tension existed on the tibial N and tendons. Subjects: Fourteen preserved cadaveric legs (8 left, 6 right) from nine bodies (4 males, 5 females) were examined. The mean age was 84±11 years. The average linear femur length was 410.7±31.7 mm and the mean femoral condyle width was 84.0±5.3 mm. Measurements: Nine anatomical variables were measured including linear femur length, femoral condyle width, tibial N diameter at the femoral condyles, tibial N diameter at the popliteal fossa apex, semimembranosus and biceps femoris tendons cross-sections, tibial N distance to the semimembranosus, tibial N distance to the biceps femoris and the number of branches from the tibial N within the popliteal fossa. All measurements, except the tibial N diameter at the fossa apex, were performed at the widest medial-to-lateral (M-L) distance of the femoral condyles and represented M-L cross-sections. Vernier calipers (Mitutoyo Corp., Japan) scaled to 0.05 mm were used to conduct all of the measurements except the linear femur length (performed with a tape measure). Descriptive statistics were performed (Microsoft Excel 2002) to explain the anatomical characteristics of the tibial N. Results: The tibial N entered the popliteal fossa near the apex and the sural N quickly branched. The muscular divisions of the tibial N began to divide proximal to the femoral condyles’ widest width. At the level of the femoral condyles, the tibial N accounted for 9.5% of the inter-hamstring distance (48.50±11.50 mm). The nerve was located 21.45±8.40 mm from the semimembranosus and 22.60±4.90 mm from the biceps femoris. Therefore, in 95% of the patients the tibial N could be located within 48.2% of the inter-hamstring distance. Conclusions: The tibial N accounted for less than 10% of the inter-hamstring distance and its location was highly variable. The high variability of the tibial N could contribute to the difficulty stimulating an optimal soleus H-reflex. Diagnostic ultrasound to locate the tibial N may be advantageous in future H-reflex testing in order to optimize electrode placement. Key Words: Cadaver, Hoffman Reflex, Anatomical Variability.