Introduction: Few mobile bearing rotating platform knee replacements were performed 20 or more years ago and there are few if any thoroughly followed series with 20 or more years of follow-up. We previously evaluated the minimum nine-year and fifteen-year results after total knee arthroplasty with the cemented Low Contact Stress rotating-platform design in a single surgeon patient cohort. The aim of this study was to provide the longer-term results of this cohort at a minimum follow-up of twenty years with an emphasis on the rates of revision, reoperation and osteolysis.

Methods: 119 primary total knee replacements were performed by a single surgeon between 1986 and 1988. At this update, 20 patients (26 primary knees) were still living and had a mean age of 83 years. Clinical evaluations to include the Knee Society clinical and functional scores and The Hospital for Special Surgery score were recorded preoperatively and at final follow-up. WOMAC scores were recorded only at further follow-up. Radiographs were evaluated for limb alignment, component position, radiolucent lines, polyethylene wear, and osteolysis. Kaplan-Meier survivorship analysis was performed with reoperation for any reason as the endpoint. IRB approval was obtained.

Results: The average preoperative Knee Society clinical and functional scores for living patients were 43 points and 49 points, respectively. At the final follow-up, these scores were 89 points and 67 points, respectively. The preoperative and final follow-up scores on The Hospital for Special Surgery knee-rating system were 61 points and 80 points, respectfully. The average scaled WOMAC score was 19 points, with lower score demonstrating a better result. No knee required revision of any component at minimum twenty year follow-up, although three knees did undergo successful re-operations for two supracondylar femoral fractures and one infection. One knee demonstrated loosening of the femoral component associated with wear of the polyethylene liner and femoral osteolysis. No knee demonstrated loosening of the tibial or patellar components. Six knees had osteolytic lesions, and in three cases these lesions were not apparent at 15 year follow-up.

Discussion: Rotating-platform mobile-bearing knee prostheses were designed to reduce contact stresses in the polyethylene by decoupling sagittal plane motion and rotation of upper surface/lower surface motion and to minimize bone-prosthesis stresses at the tibial surface. This study demonstrates the durability of the LCS prostheses at a minimum follow-up of twenty years and these results are comparable if not better than the twenty-year results reported for fixed bearing devices. These results are especially noteworthy when one considers that gamma irradiated polyethylene was utilized. For total knee replacements to predictively perform for 20 or more years in more active patients, the kinematics allowed by decoupling the sagittal plane and rotational kinematics in rotating platform knee replacements may be optimal.