

# Do you Double Butter? A Cementation Technique that Significantly Reduces Lipid Contamination of the Tibial Baseplate in Total Knee Arthroplasty

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**INTRODUCTION:** Aseptic loosening remains among the most common causes of failure and reason for revision following total knee arthroplasty (TKA). Recent literature suggests that the implant-cement interface is the “weak link” in implant fixation and that methods for decreasing aseptic tibial loosening should focus on improving fixation of this interface. One theory for this weak link is the propagation of lipids between the implant-cement interface leading to a debonding pattern of failure. Currently, there is not a standardized cementing technique for primary total knee replacement. While some techniques might seem ubiquitous, there is significant variability in technique even amongst AAHKS members. Methods for limiting or preventing lipid contamination of the implant-cement interface are associated with increased initial implant fixation and should be incorporated into best practices for cement technique.

**METHODS:** Acrylic models of five commonly used tibial baseplates were created to allow for direct visualization of debonding during experimental cementing. Two cementing techniques were then employed in triplicate for each implant. The first method involved coating only the tibial model while the second included application to the entire baseplate and keel. After each implantation episode the degree of contamination was recorded and percent debonding calculated.

**RESULTS:** We saw a significant decrease ( $p < 0.05$ ) in lipid contamination for each baseplate after application of cement material to the baseplate and tibia compared with the tibial component alone (Implant A:  $p = 0.0014$ , Implant B:  $p = 0.0004$ , Implant C:  $p = 0.011$ , Implant D:  $p = 0.0035$ , implant E:  $p = 0.021$ ). Additionally, we found significant differences between individual implants ( $p < 0.05$ ) suggesting that both implant design and technique are important factors in TKA cementation and risk of aseptic loosening.

**DISCUSSION:** Herein we demonstrate significant decrease in lipid contamination and subsequent risk of aseptic loosening by cement technique.

**SIGNIFICANCE:** Implant design and cementation technique influence baseplate lipid contamination. The double-butter technique limits lipid contamination and aseptic tibial loosening

