

## OREF Collaborative Research Agenda: Hip & Knee Arthroplasty

BASIC SCIENCE RESEARCH (B)	CLINICAL RESEARCH (C)	HEALTH SERVICES RESEARCH (HS)
<input type="checkbox"/> 1.) What biomarkers predict success or failure of an implant?	<input type="checkbox"/> 1.) Is there a correlation between incision size and approach to outcomes?	<input type="checkbox"/> 1.) What is the right path for the responsible introduction of new products/technology?
<input type="checkbox"/> 2.) Examine the durability of biomaterials in joint replacement (especially as applicable to younger patients)?	<input type="checkbox"/> 2.) Are there clinical and economic benefits in the use of personalized approaches (patient-specific instrumentation and coding guides and robotics) to implants and instrumentation?	<input type="checkbox"/> 2.) Develop best practices for consensus of process and community standard of care for Total Knee Arthroplasty to enhance reimbursement and improve outcomes (consensus development for guideline creation). (Ex. SCIP)
<input type="checkbox"/> 3.) What is the relationship between diagnostic testing (including serology, genetics, metal related pathology and imaging) to early implant failure?	<input type="checkbox"/> 3.) What is the major difference between hip and knee recovery?	<input type="checkbox"/> 3.) How do we reduce pre-op and post-op costs?
<input type="checkbox"/> 4.) Can we develop biologic or regenerative approaches for delaying/replacing arthroplasty?	<input type="checkbox"/> 4.) What are the most common factors in patient dissatisfaction in total joint arthroplasty?	<input type="checkbox"/> 4.) Should infected total joints be considered a “never-events” (by gov’t)?
<input type="checkbox"/> 5.) Define/identify the pathogenesis of osteoarthritis (e.g., genetics, activities, trauma, patient characteristics, medication, weight, morphology).	<input type="checkbox"/> 5.) What factors shorten recovery time for knee arthroplasty?	<input type="checkbox"/> 5.) Define the cost and economic/societal benefits to arthroplasty.
<input type="checkbox"/> 6.) Examine the length of survival rate of bearing materials versus cartilage.	<input type="checkbox"/> 6.) Development of optimal risk reduction strategies for arthroplasty surgeries to prevent deep vein thrombosis (DVT).	<input type="checkbox"/> 6.) Leverage existing orthopaedic datasets (mentioned Kaiser and Finnish). Determine what is the appropriate size, data accuracy and quality, and handling of missing data.
<input type="checkbox"/> 7.) Determine what information we need know to improve outcomes and patient care. <i>(Part 1 of a 3 part question – C-Q.15 &amp; HS-Q.15)</i>	<input type="checkbox"/> 7.) Development of optimal risk reduction strategies for total joint arthroplasty surgeries to improve pain management.	<input type="checkbox"/> 7.) What are the ideal outcomes to measure the success of total joint arthroplasty – from doctor and/or patient perspective?
<input type="checkbox"/> 8.) Examining the use of orthobiologics alone or in combination for the treatment of osteoarthritis and/or restoration or reconstructive surgery of affected joints(s).	<input type="checkbox"/> 8.) What are the most common factors in premature failure in hip and knee arthroplasty (e.g., surgical, hospital, implant, rural versus urban)?	<input type="checkbox"/> 8.) What are the factors that cause wide variations in hospital fees in total joint arthroplasty surgery?

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<input type="checkbox"/> 9.) Examining biomarkers to monitor changes related to the treatment of osteoarthritis.	<input type="checkbox"/> 9.) What are the best practices in preventing infection in total joint arthroplasty?	<input type="checkbox"/> 9.) Develop standardized methods of measuring outcome and ensure granularity and sensitivity (this would be helpful for both insurance reimbursements and product development).
<input type="checkbox"/> 10.) Examine the role of debris in mesenchymal stem cell differentiation: Does it inhibit or alter in any way?	<input type="checkbox"/> 10.) Determining best practices for arthroplasty procedures which are both reproducible and teachable processes.	<input type="checkbox"/> 10.) Research manpower regarding the number of surgeons available versus the need/demand.
<input type="checkbox"/> 11.) Examine the increasing role of porous metal augments as a substitute for structural and morsellized allografts.	<input type="checkbox"/> 11.) How do we measure outcomes in the first post-operative year?	<input type="checkbox"/> 11.) What is the appropriate utilization of total joint arthroplasty – are we under or over-utilizing joint replacement?
<input type="checkbox"/> 12.) Understanding cartilage restoration technologies and the additives (biologic or other).	<input type="checkbox"/> 12.) Examine single use cutting guides pertaining to Total Knee Replacement outcomes and patient satisfaction early on (1 <sup>st</sup> year post-op).	<input type="checkbox"/> 12.) How do demographic factors (obesity, race/ethnicity, and socio-economic status) affect outcomes in total knee and hip arthroplasty including?
<input type="checkbox"/> 13.) Examining wear in situations where deliberate component malalignment is realized as well as in cases of unpredictable loading inclusive of dwell time between loading.	<input type="checkbox"/> 13.) Post-op home therapy versus structure therapy: Which is better?	<input type="checkbox"/> 13.) What is the impact of the domestic legal environment on the cost of total joint arthroplasty?
<input type="checkbox"/> 14.) Understanding the pathophysiology and early diagnosis of diseases resulting from host tissue-implant interfaces, especially those resulting from wear debris of prosthetic implant materials.	<input type="checkbox"/> 14.) How do we improve patient satisfaction with hip and knee replacement?	<input type="checkbox"/> 14.) Role of decision-making: Examining Health Equity/ Health Disparities in total joint arthroplasty.
	<input type="checkbox"/> 15.) What is the impact of the timing of the intervention on the outcome of the procedure?	<input type="checkbox"/> 15.) What is the value to society of total knee replacement/total hip replacement on the economics, quality of life, productivity, ethics, and social/family issues? <i>Part 3 of B-Q.7</i>
	<input type="checkbox"/> 16.) How do we improve outcomes using information we gather for improving outcomes and patient care? <i>(Part 2 of B-Q.7)</i>	<input type="checkbox"/> 16.) What is the role of regulation (e.g., FDA) and its impact on the commercialization of technological advances derived from orthopaedic research?

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	<input type="checkbox"/> 17.) Examining the interaction of metal-metal interfaces, articulation and/or modular interactions, and patient sensitivity, osteolytic response and soft tissue damage.	
	<input type="checkbox"/> 18.) Development of computational technologies predictive of kinematic pathways following joint replacement as well as the influence of in-vivo loading on polyethylene and its additives on surface and subsurface stresses.	
	<input type="checkbox"/> 19.) What is the impact of advances in technology, surgical technique, education, etc. on measurable patient-centered outcomes?	