

Research Project Details	
Title	Understanding knee OA pain through brain neurochemistry in working-age total knee replacement patients
Investigator(s)	Dr. Ashley Harris, University of Calgary Dr. Sarah Manske, University of Calgary Dr. Jason Werle, University of Calgary Dr. Richard Ng, University of Calgary
Funding Period	2021-2024
Budget	\$59,064.00
Issue/Rationale	<p>Pain in knee osteoarthritis (OA) is poorly understood. While total knee replacement (TKR) provides pain relief for many patients as the joint structures presumed to be causing pain are removed, many working-age patients have persistent pain that cannot be explained by surgical complications. This persistent post-TKR pain results in poor return to work rates.</p> <p>The presumption that replacing the joint removes the source of pain does not consider that pain can be centralized, specifically, pain can develop and/or persist due to aberrant pain processing in the brain. Centralized pain may explain, in part, why knee OA pain levels do not always correspond with joint damage as visualized on x-ray. We suggest centralized pain needs to be understood in order to also address the high incidence of persistent post-TKR pain.</p>
Objective(s)	<p>Our overall objective is to quantify how neurochemistry is associated with chronic knee OA pain, pain resolution and functional outcomes following TKR. To achieve this objective, we will investigate working-age knee OA patients pre- and post-TKR with the following aims:</p> <ul style="list-style-type: none"> <li>• Determine differences in glutamate and GABA levels between knee OA patients with evidence of high levels of central pain processing compared with patients with low levels of less central pain processing, prior to TKR.</li> <li>• Quantify changes in glutamate and GABA levels with the resolution of pain following TKR.</li> <li>• Examine the relationship between baseline and changes in brain glutamate and GABA levels and with post-surgical function and return-to-work status.</li> </ul>
Anticipated Results/ Impact	In addition to better understanding knee OA and its recovery, total knee replacement (TKR) to treat knee OA provides a unique opportunity to examine recovery from chronic pain. Understanding the neurochemical contributions to chronic pain resolution will aid in developing better treatments for knee OA as well as other chronic pain conditions.
Keywords	Pain, neurochemistry, chronic pain, total knee replacement, osteoarthritis