

# Management of knee and hip osteoarthritis: an opportunity for the Canadian chiropractic profession

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*Knee and hip osteoarthritis (OA) place a significant burden on the Canadian health system and are a major public health challenge. This brief commentary discusses the recently published Osteoarthritis Research Society International guideline and the American College of Rheumatology guideline for the management of OA. Special attention has been given to the role of manual therapy, exercise, and patient education for the treatment of knee and hip OA. This article also reviews the Good Life with osteoArthritis in Denmark (GLA:D®) treatment*

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La prise en charge de l'ostéoarthrite de la hanche et du genou : une occasion pour les chiropraticiens canadiens

*L'ostéoarthrite (OA) du genou et de la hanche impose un lourd fardeau économique au système de santé canadien et constitue un grave problème de santé publique. Le présent article porte sur la ligne directrice publiée récemment par l'Osteoarthritis Research Society International et la ligne directrice sur la prise en charge de l'ostéoarthrite de l'American College of Rheumatology. L'auteur accorde une attention spéciale à la thérapie manuelle, à l'exercice physique et à l'information au patient dans le traitement de l'OA du genou et de la hanche. Les auteurs passent en revue le programme Good Life with osteoArthritis in Denmark (GLA:D®) servant à mettre en œuvre des*

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*program for knee and hip OA and the implementation of this program in Canada. Lastly, the authors discuss the opportunity for the Canadian chiropractic profession to embrace treatment programs like GLA:D® and take an active role in the strengthening of the Canadian health system from a musculoskeletal perspective.*

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*lignes directrices pour le traitement de l'OA du genou et de la hanche et à mettre en œuvre ce programme au Canada. Enfin, les auteurs se penchent sur l'occasion donnée aux chiropraticiens canadiens d'adopter des programmes de traitement comme GLA:D® et de jouer un rôle actif dans le renforcement du système de soins de santé canadien en prenant en charge des affections musculosquelettiques.*

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MOTS CLÉS : chiropratique, commentaire, exercice physique, renforcement du système de soins de santé, ostéoartrite

## Introduction

Knee and hip osteoarthritis (OA) is the twelfth leading cause of global disability.<sup>1</sup> Both the disability and overall burden attributed to OA has increased globally by over 31% in a 10-year period.<sup>1,2</sup> The high levels of disability and morbidity equate to significant health system expenditures. OA was the eighth leading cause of US health expenditures in 2016 (80.0 billion United States dollars (USD) or 2.96% of total health system expenditure).<sup>3</sup> OA costs are estimated to range from 1.0 to 2.5% of the national gross domestic product in high-income countries like Canada.<sup>4</sup>

In Canada, almost 4 million individuals have OA<sup>5</sup> and over 122 000 knee and hip replacements are performed annually<sup>6</sup>. The impact of OA in Canada has been predicted to reach direct costs over 157.5 billion Canadian dollars (CAD) in 2020<sup>7</sup>, with over 1.2 billion CAD on replacement surgeries alone<sup>6</sup>. Diagnostic imaging and medication expenses also contribute to OA costs.<sup>8</sup> OA is a major public health challenge<sup>9</sup> and poses a significant economic burden that is expected to increase<sup>7</sup> in response to societal aging and the growing obesity epidemic<sup>10</sup>. Global health systems require immediate strengthening to combat the rising societal impact of OA as current health systems are not prepared to handle the increasing demand for OA care. This commentary reviews the latest recommendations on patient education, exercise, and manual therapy for knee and hip OA. While there are numerous interventions available for OA, this commentary focuses on education and

exercise for their central role in OA management, and on manual therapy for its prominence within the chiropractic profession. Finally, this commentary highlights opportunities for the chiropractic profession to actively contribute to the strengthening of the Canadian health system from a musculoskeletal health perspective.

## OA management

Recently, both the Osteoarthritis Research Society International (OARSI) and American College of Rheumatology (ACR) published updated guidelines for the non-surgical management of knee and hip OA.<sup>11,12</sup> According to these guidelines, patient education including self-management strategies, land-based exercise, and weight-loss for overweight patients are considered standard management for all patients with knee and hip OA. These recommendations align with other internationally developed guidelines.<sup>13-15</sup> One unique feature worthy of mention in the OARSI guideline is that recommendations have been made for a variety of patient profiles, including patients with no comorbidities, those with gastrointestinal or cardiovascular comorbidities, frailty, and widespread pain or depression.<sup>12</sup>

Manual therapy has not been included in the OARSI guideline as a result of limited supporting evidence.<sup>12</sup> The ACR guideline recommends against the use of manual therapy in conjunction with exercise, as limited data shows an additional benefit over exercise alone.<sup>11</sup> However, a recent systematic review found that few OA

guidelines make recommendations on complementary and alternative medicine (CAM) interventions<sup>16</sup>, despite almost 50% of knee OA patients using CAM interventions, including manual therapy<sup>17</sup>. Knee OA is also the most frequently cited reason for older adults to seek CAM therapies.<sup>18</sup> In spite of this understanding, current practice guidelines rarely make mention for or against the utility of CAM therapies. We perceive this lack of attention to CAM in guidelines as problematic, as little guidance is available to clinicians on commonly used interventions in community practice.

### *Manual therapy for OA*

Manual therapy refers to a collection of therapeutic interventions used by chiropractors and physiotherapists in the management of OA<sup>19</sup>, although manual therapy is also used by a variety of other healthcare practitioners. The current lack of high-quality evidence prevents manual therapy from being considered a core treatment<sup>19</sup>, which is reflected in the recent ACR and OARSI guidelines. However, the National Institute for Health and Care Excellence (NICE) guideline and the US Bone and Joint Initiative recognize the potential contributions that manual therapy can have on patient outcomes.<sup>13,15</sup> The NICE guidelines consider manual therapy an appropriate adjunct treatment for hip OA<sup>15</sup>, while the US Bone and Joint Initiative recommends consideration of manual therapy when in combination with exercise<sup>13</sup>. A recent review on manual therapy found improvements in pain and physical function in the short- and long-term (up to six months) for patients with OA.<sup>19</sup> This investigation included four randomized control trials (RCT) comparing manual therapy alone to other or no interventions and excluded trials that combined manual therapy with other treatment options. However, three of the included studies were rated as having a high risk of bias and only one study examined hip OA patients.<sup>19</sup> As a result, the evidence for manual therapy in the management of OA was deemed inconclusive.

Specifically for knee OA, a systematic review including 11 RCTs concluded that the effects of manual therapy with and without exercise provides short-term benefits on pain level, functional disability, range of motion and physical performance.<sup>20</sup> These results align with an earlier review that found passive joint mobilization combined with exercise was associated with moderate reductions in pain.<sup>21</sup> However, it has been suggested that the vast ma-

majority of knee OA studies are conducted by Chinese authors and therefore may be missed by English reviewers due to language barriers.<sup>22</sup> A systematic review including 14 RCTs from both Chinese and English scientific databases concluded that manual therapy is an effective stand-alone therapy for relieving pain and stiffness while improving physical functioning in patients with knee OA.<sup>23</sup> However, this review included studies using only the Western Ontario and McMaster Universities Osteoarthritis Index as the primary outcome and excluded an additional 48 studies with differing outcome measures. As such, it is difficult to determine the impact Chinese literature should have on treatment recommendations.

A systematic review by Beumer *et al.*<sup>24</sup> on hip OA including 19 RCTs failed to identify any benefits associated with manual therapy when combined with exercise (water-based or land-based) or when applied as an isolated intervention. Therefore, the best available evidence does not support the use of manual therapy for short-term effects on pain and no long-term conclusions were made.<sup>24</sup> These findings are in opposition to a previous review that suggested manual therapy reduces pain and disability in the short-term and is associated with reduced usage of non-steroidal anti-inflammatories at long term follow-up.<sup>25</sup> However, this review included only two studies on manual therapy, whereas the updated review by Beumer *et al.*<sup>24</sup> included six studies.

### *Education and exercise for OA*

Education and goal-oriented self-management are essential in the treatment of OA.<sup>26</sup> A 2014 Cochrane review including 29 studies found self-management education programs may improve self-management skills, pain, and function, but more research is needed as only low to moderate quality evidence exists.<sup>27</sup> It has been suggested that quality education for OA should inform patients on modifiable risk factors, disease pathophysiology, importance and safety of exercise for joint and general health, consequences of a sedentary lifestyle, evidence-informed treatment and coping strategies.<sup>26</sup> This knowledge empowers patients to actively and confidently manage their disease and encourages life-long physical activity participation.<sup>26</sup>

The evidence for exercise therapy in the management of knee and hip OA is unequivocal. Multiple Cochrane reviews have shown benefits in the short and long-term for pain, function, and other patient outcomes for both knee

and hip OA.<sup>28-31</sup> Supervised land-based exercise significantly improves pain, function and quality of life in those with knee OA irrespective of type of exercise and delivery mode (one-on-one, group or home-based).<sup>29</sup> Moderate quality evidence suggests aquatic exercise is an appropriate alternative to land-based exercise, as clinically meaningful effects on pain, disability, and quality of life with little risk of adverse events was shown in a Cochrane review.<sup>28</sup> Verhagen *et al.*<sup>32</sup> recently updated two Cochrane exercise reviews<sup>28,29</sup> and found that sufficient evidence has existed for exercise in the management of knee OA since 1998. A similar analysis concluded that ample evidence has existed since 2002 to support the effectiveness of exercise for knee OA.<sup>33</sup> It is now well-accepted there is no longer a need for replication of exercise trials, as the benefit of exercise for knee OA has been clear for at least a decade.<sup>24</sup> Rather, future studies should examine different types, delivery modes, and dosing of exercise interventions, as optimal exercise programs still remain unknown.<sup>26,29,30</sup>

### Implementing education and exercise

Numerous programs aimed at implementing education and exercise as standard care for OA are available, such as the Physiotherapy Exercise and Physical Activity (PEAK) program<sup>34</sup> from the University of Melbourne and the OA Optimism online resource<sup>35</sup>. One program garnering international attention is Good Life with osteoArthritis in Denmark (GLA:D®). GLA:D® is an evidence-informed education and exercise program tailored for individuals with knee and hip OA.<sup>36</sup> It is a not-for-profit initiative with the aim of facilitating the implementation of guideline-based management for knee and hip OA.<sup>36,37</sup> GLA:D® is a standardized, yet personalized group-based exercise program consisting of two education sessions and twelve sessions of supervised neuromuscular training over a six-to eight-week period.<sup>36,37</sup> According to the GLA:D® Denmark 2018 Annual Report, 350 locations offer GLA:D® to about 10,000 patients yearly.<sup>38</sup> Immediate effects of the program include reductions in pain and pain medication use, increased physical function, and improved quality of life. Long-term results suggest that pain and quality of life improvements were maintained or even improved one-year post-GLA:D® and fewer sick leaves were reported by participants.<sup>38</sup> The implementation of GLA:D® has been so successful in Denmark that one Danish health region has implemented policy requiring knee OA patients

to complete GLA:D® prior to receiving a surgical consultation. Moreover, the success of GLA:D® in Denmark has led to the international expansion of the program in Australia, New Zealand, China, Switzerland, Austria, the Netherlands, and Canada.

GLA:D™ Canada was launched in 2016 and has replicated the strong results observed in Denmark. According to the 2019 Annual Report, GLA:D® is available at 209 locations across nine provinces and one territory.<sup>39</sup> Over 3800 patients have been through the program thus far, and the results have been promising. Significant improvements in pain and function have been observed immediately after program completion and at long-term follow-up periods.<sup>39</sup> Additionally, improvements in body mass index for overweight participants have been shown.<sup>39</sup> A recent study also found GLA:D® to be cost-effective in Australia – a health system similar to the Canadian system – if just one in 12 participants (8%) avoid surgery.<sup>40</sup> While there are no available estimates of how many Canadian patients in GLA:D® have avoided surgery, a follow-up study from two RCTs using a similar intervention to GLA:D® found 68% of participants had avoided surgery two years post-intervention.<sup>41</sup> Additionally, Health Quality Ontario has recommended the public funding of GLA:D as a means to reduce health system costs.<sup>42</sup>

Education and exercise programs for knee and hip OA have the additional advantage of remote implementation using online care delivery platforms. A growing number of publications have shown positive results for the use of telerehabilitation in patients with chronic pain/OA of the knee and hip.<sup>43-46</sup> One large RCT (148 participants) of older patients with chronic knee pain (representing knee OA) found statistically and clinically significant improvements in pain and function at three-month follow-up and in function at nine-month follow-up.<sup>47</sup> An internet-delivered care package consisting of online educational material, online pain-coping skills training modules, and seven teleconference sessions with a physiotherapist over 12 weeks was compared to online educational material only.<sup>47</sup> During the teleconference sessions, physiotherapists performed a patient assessment and prescribed a home exercise program for lower-limb strengthening.<sup>47</sup> Another RCT (70 patients) found a telerehabilitation intervention showed no short-term differences in quality of life, pain, function, and symptoms compared to in-person rehabilitation following total hip replacement.<sup>48</sup> The

telerehabilitation program consisted of videoconferencing with a physiotherapist to deliver an at-home exercise program aimed at strengthening the lower limb.<sup>48</sup> However, this study evaluated only the short-term effects and thus, no conclusions can be drawn regarding the long-term effectiveness of this telerehabilitation program. Additionally, a large RCT with nine-month follow-up is currently underway in Australia comparing the PEAK program to traditional in-person care for knee OA,<sup>49</sup> which should provide more definitive results on the effectiveness of remote delivery of education and exercise.

Despite evidence to suggest that education and exercise can be delivered at least as effectively as in-person care for patients with knee and hip OA, it is important to appreciate the role of patient and clinician preference in care delivery. Qualitative research demonstrates that older patients' perceived telerehabilitation as convenient and enjoyable, and that it promoted motivation, self-awareness, and a positive therapeutic relationship.<sup>50</sup> However, patients did note that telerehabilitation could not completely replace the traditional in-person interaction.<sup>50</sup> In another study exploring the experiences of patients and clinicians using Skype to deliver exercise for knee OA, both patients and clinicians were satisfied with the care.<sup>51</sup> A common theme amongst both patients and clinicians was that care delivery via Skype empowered patients and created a positive therapeutic relationship.<sup>51</sup> Clinicians, however, did report feeling uncomfortable without a hands-on assessment and with having to adapt normal clinical routines.<sup>51</sup> Interestingly, clinicians also noted increased comfort having known that serious pathologies had been ruled out by the research team prior to patient enrollment in the study<sup>51</sup>, which is not likely reflective of clinical practice for most chiropractors.

Overall, it appears that remote delivery of education and exercise interventions for knee and hip OA, and potentially other musculoskeletal conditions, is at least as effective and enjoyable as traditional in-person care delivery. As such, clinicians should not be hesitant to engage in emerging care delivery models, although more research is needed to better understand these programs. Following the emerging evidence for online delivery of education and exercise, GLA:D™ Canada is now offering online training of clinicians and remote delivery of the program to patients using an online platform. Although the decision to offer GLA:D® remotely was in part due

to the COVID-19 pandemic, online delivery of the program allows for greater access to the program, especially in more remote Canadian communities where there are limited number of healthcare professionals. While we are unaware of any evidence evaluating patient outcomes using the remote program, we expect this information to be made available in the near future.

### *Opportunity for the chiropractic profession*

Despite GLA:D® gaining traction in Canada, there appears to be a reluctance amongst the chiropractic profession to embrace programs of this nature. While over 1000 Canadian healthcare practitioners have been trained in GLA:D®, only 11% are chiropractors compared to physiotherapists at 74%.<sup>39</sup> Barriers to participation, including cost of certification and lack of clinic space dedicated to rehabilitation, amongst others, may explain the small number of chiropractors currently offering GLA:D®. However, we view this as an opportunity for the chiropractic profession to help strengthen the Canadian health system by the adoption of programs like GLA:D® and other methods of best-practice implementation. We encourage readers to explore other education and exercise implementation programs for OA, such as the PEAK program for knee OA<sup>34</sup> and OA Optimism online resource<sup>35</sup>. Fortunately, institutions like the Canadian Memorial Chiropractic College have recently begun to offer GLA:D® at their teaching clinics and we hope this will spur a greater uptake of treatment programs that do not focus on manual therapy by members of the Canadian chiropractic profession and future chiropractic graduates. Chiropractors can help offset the large expenses incurred by the Canadian health system through costly interventions like joint replacement surgeries through increased participation in programs like GLA:D®.

### **Conclusion**

We do not wish for readers to misconstrue this commentary as a call to abandon manual therapy in the care for patients with OA. Rather, we are advocating for increased recognition of the role education and exercise play in the evidence-based management of OA. In fact, a recent publication in this journal by one of the authors of this commentary presents how chiropractors may choose to deliver manual therapy for knee OA within an evidence-based framework.<sup>52</sup> However, an attitudinal shift by the profes-

sion is required. There must be a willingness amongst practitioners to embrace management strategies that do not conform to traditional approaches used in the profession, such as individual patient encounters and manual therapy-driven care plans. The recent COVID-19 pandemic should illustrate that musculoskeletal care, including that delivered by chiropractors, can be quickly adapted from traditional chiropractic care delivery models. We believe that this paradigm shift, if adopted, can position the chiropractic profession to take a leadership role in the management of OA and the future of the Canadian health system at large.

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