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Defence Team Physiotherapists Ordering Diagnostic Imaging: A Patient-Centered and High-Value Initiative

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Exercise Solo Flight

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Defence Team Physiotherapists Ordering Diagnostic Imaging: A Patient-Centered and High-Value Initiative

DEFENCE TEAM PHYSIOTHERAPISTS ORDERING DIAGNOSTIC IMAGING: A PATIENT-CENTERED AND HIGH-VALUE INITIATIVE

Musculoskeletal (MSK) injuries and associated conditions are common in the Canadian Armed Forces (CAF) and allied militaries.[1,2] MSK injuries detract from CAF members' quality of life, delay or limit their career progression, consume organizational health care resources, and are a leading cause of early, involuntary, release from service.[3,4] The timely, efficient, and effective management of MSK injuries is essential to optimizing the health and wellness of military members, providing units with prognosis concerning the employability and "deploy-ability" of their members, making best use of organizational resources, and ensuring the credibility of the Canadian Forces Health Services (CFHS). Appropriately utilized diagnostic imaging (DI) can provide clinicians, patients, and other stakeholders with important information concerning both "serious" and "routine" pathology.[5,6] Despite their recognized expertise in the diagnosis and management of MSK injuries as well as in screening for serious pathology,[7,8] Defence Team (DT) physiotherapists are currently prohibited from ordering MSK relevant DI (e.g. radiographs, ultrasound, computed tomography, or magnetic resonance imaging) within

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[1] François L Thériault, *Health and lifestyle information survey of Canadian Armed Forces personnel 2013/2014-Regular Force report* (National Defence= Défense nationale, 2016).

[2] Joseph M Molloy et al., "Musculoskeletal injuries and United States Army readiness part I: overview of injuries and their strategic impact," *Military medicine* 185, no. 9-10 (2020).

[3] Major Raymond D Trudel, "JCSP 47 Master of Defence Studies." 2-3.

[4] Molloy et al., "Musculoskeletal injuries and United States Army readiness part I: overview of injuries and their strategic impact." e1461-63.

[5] Robert E Boyles et al., "Physical therapist practice and the role of diagnostic imaging," *journal of orthopaedic & sports physical therapy* 41, no. 11 (2011). 829-831.

[6] Brenna Bath, Stacey Lovo Grona, and Bonnie Janzen, "A spinal triage programme delivered by physiotherapists in collaboration with orthopaedic surgeons," *Physiotherapy Canada* 64, no. 4 (2012). 356-358.

[7] Alice B Aiken and Mary Ann McColl, "Diagnostic and treatment concordance between a physiotherapist and an orthopedic surgeon–a pilot study," *Journal of interprofessional care* 22, no. 3 (2008). 253-254.

[8] Troy McGill, "Effectiveness of physical therapists serving as primary care musculoskeletal providers as compared to family practice providers in a deployed combat location: a retrospective medical chart review," *Military medicine* 178, no. 10 (2013). 1115-1116.

CFHS. This represents a deviation from physiotherapy practice in allied militaries and is increasingly out of step with civilian physiotherapy practice in Canada.[9,10] Furthermore, it contributes to inefficiency in the use of CFHS resources, may delay prognosis, and negatively impacts the "patient experience" as well as care delivery.[11,12] "Strong, Secure, Engaged: Canada's Defence Policy" (SSE) emphasizes the importance of the health and well-being of CAF members and envisions a revised approach to care for CAF members[13] while the Defence Team Total Health and Wellness Strategy (DTHWS) advocates for an "evidence based framework" and "focus on improving health outcomes".[14] This paper will demonstrate that permitting DT physiotherapists to order DI for MSK conditions would contribute to more efficient and effective use of CFHS resources without compromising patient safety or outcomes, reduce the burden on primary care clinicians, and is a CAF member focused initiative that is aligned with both SSE and the DTHWS. It would improve the management of MSK conditions in the CAF by enhancing the "patient experience," reducing wait-times for prognosis and definitive treatment and aligning CFHS with Canadian physiotherapy practice trends with respect to MSK management. The CAF should leverage the expertise of DT physiotherapists by extending their scope of practice to include ordering DI for MSK conditions to improve service delivery, optimize use of organizational resources, and improve patient experience.

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[9] Trudel, "JCSP47 Master of Defence Studies." 48-58.

[10] Major AJ Hannaford and Captain B Stefanov. "Business Case for Direct Referral for Diagnostic Imaging by Defence Team Physiotherapists (Canadian Forces Health Services – Physiotherapy, 2021).

[11] Trudel, "JCSP 47 Master of Defence Studies." 48-58.

[12] Mallory Pike et al., "Pilot study: The effectiveness of physiotherapy-led screening for patients requiring an orthopedic intervention," *Journal of Military, Veteran and Family Health* 7, no. 2 (2021). 3-6.

[13] Government of Canada, Strong, Secure, Engaged: Canada's Defense Policy, (Ottawa 2017).

[14] Government of Canada, Defense Team Total Health and Wellness, (Ottawa 2019).

Guidelines, Costs, and Outcomes

Physiotherapists have demonstrated a judicious, responsible, and evidence-based approach to the application of DI for MSK conditions in the jurisdictions and systems where they have been afforded ordering privileges.[15,16,17] United States (US) military physiotherapists have had DI ordering privileges since 1972.[18] The arguments against extending DI privileges to US military physiotherapists fifty years ago continue to be echoed in some corners of Canadian healthcare today citing potential for overuse and increased health care costs. In recent years, increased focus on overuse, or misuse, of DI by all clinicians has come into the spotlight. Inappropriate use of DI has been identified as being potentially harmful to the patient through the detection of clinically insignificant anomalies and the subsequent inappropriate management of these findings by clinicians or unwarranted "hypervigilance" generated in patients.[19] However, these concerns with respect to physiotherapists ordering DI have been demonstrated to be unfounded. With respect to MSK diagnosis, physiotherapists have been shown to have accuracy similar to orthopedic specialists[20] as well as high levels of diagnostic agreement with emergency department physicians.[21] With respect to selecting DI, a recent 5-year retrospective study regarding the appropriateness of DI usage by physiotherapists showed that 91% of all tests

[15] Aaron P Keil et al., "Ordering of diagnostic imaging by physical therapists: a 5-year retrospective practice analysis," *Physical therapy* 99, no. 8 (2019). 1022-1024.

[16] Michael S Crowell et al., "Diagnostic imaging in a direct-access sports physical therapy clinic: a 2-year retrospective practice analysis," *International journal of sports physical therapy* 11, no. 5 (2016). 708.

[17] Douglas P Gross et al., "A descriptive study of physiotherapist use of publicly funded diagnostic imaging modalities in Alberta, Canada," *European Journal of Physiotherapy* 21, no. 3 (2019). 171-174.

[18] Boyles et al., "Physical therapist practice and the role of diagnostic imaging." 829-30.

[19] Denise Kendrick et al., *The role of radiography in primary care patients with low back pain of at least 6 weeks duration: a randomised (unblinded) controlled trial* (National Co-ordinating Centre for HTA. Great Britain, 2001).

[20] Aiken and McColl, "Diagnostic and treatment concordance between a physiotherapist and an orthopedic surgeon–a pilot study."

[21] E Matifat et al., "Concordance between physiotherapists and physicians for care of patients with musculoskeletal disorders presenting to the emergency department," *BMC Emergency Medicine* 19, no. 1 (2019). 3-6.

ordered were clearly in line with American College of Radiology Appropriateness Criteria (ACRAC).[22] A previous retrospective study also found that physiotherapists demonstrated high levels of accuracy with respect to MSK diagnosis in addition to appropriately selecting DI; the physiotherapy diagnosis compared to surgical diagnosis was 90% for the 2-years included in the study and physiotherapists achieved greater than 80% of concordance with ACRAC.[23] Physiotherapists possess the diagnostic capabilities to adhere to DI ordering guidelines when selecting DI for MSK conditions.

"Low-value" and inappropriate use of DI for MSK conditions has been cited in the literature as a clinical practice issue that may contribute to waste of health care resources, unnecessary costs, and potential patient harm.[24] It has been suggested that physiotherapists would further contribute to this problem if permitted to order DI. However, it does not appear that physiotherapists practicing in a military setting are a significant contributor to that issue.[25] Physiotherapists with DI ordering privileges practicing in a military primary care setting have been observed to order DI less frequently, and to incur less associated costs, with no difference in return to duty outcomes, compared to other primary care clinicians when employed in a military primary care setting.[26] This may be largely due to greater adherence to clinical guidelines related to ordering DI stemming from concerns about losing this "expanded" practice

[22] Keil et al., "Ordering of diagnostic imaging by physical therapists: a 5-year retrospective practice analysis."1022-1024.

[23] Crowell et al., "Diagnostic imaging in a direct-access sports physical therapy clinic: a 2-year retrospective practice analysis." 708.

[24] Elin Kjelle et al., "Characterizing and quantifying low-value diagnostic imaging internationally: A scoping review," *BMC Medical Imaging* 22, no. 1 (2022). 1-4.

[25] McGill, "Effectiveness of physical therapists serving as primary care musculoskeletal providers as compared to family practice providers in a deployed combat location: a retrospective medical chart review." 1115-1120.

[26] McGill, "Effectiveness of physical therapists serving as primary care musculoskeletal providers as compared to family practice providers in a deployed combat location: a retrospective medical chart review." 1115-1120.

privilege were it to be abused.[27] Physiotherapists appear to utilize DI in an appropriate and "high value" manner as part of their management of MSK conditions.

Failure to order appropriate DI prior to referral to medical specialists is also a concern. While DI usage and associated costs for MSK conditions have been observed to be higher for non-physiotherapy primary care clinicians in military settings,[28] a recent study conducted in a CFHS clinic also identified that primary care clinicians often did not order appropriate DI prior to referring to orthopedic specialists. Referring to an orthopedic specialist without the indicated imaging, commonly radiographs,[29] contributes to increased wait times, costs, and more appointments per patient.[30] In this case, screening of referrals to an orthopedic specialist from primary care physicians by DT physiotherapists was associated with reduced wait times for CAF members to access specialty MSK services (i.e. orthopedics).[31] In this study, instead of being able to order the required DI directly, the reviewing DT physiotherapist had to arrange for DI to be ordered by the primary care clinician, as a result, additional potential resource savings were not realized. This study suggests that DT physiotherapists are well informed concerning indications for DI and able to apply appropriate guidelines for MSK conditions. Extending their scope to include ordering DI would contribute to reduced wait times for access to speciality services, as well as fewer appointments per patient, thereby enhancing the patient's "experience" and reducing costs.

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[27] Trudel, "JCSP 47 Master of Defence Studies." 48-54.

[28] McGill, "Effectiveness of physical therapists serving as primary care musculoskeletal providers as compared to family practice providers in a deployed combat location: a retrospective medical chart review." 1115-1120.

[29] Lynn N McKinnis and Michael Mulligan, *Musculoskeletal Imaging Handbook: A Guide for Primary Practitioners* (FA Davis, 2014).

[30] Pike et al., "Pilot study: The effectiveness of physiotherapy-led screening for patients requiring an orthopedic intervention." 3-15.

[31] Lucie Campagna-Wilson et al., "Improving the referral process for orthopedic services: Results of the rehabilitation medicine access program (orthopedics)," *Journal of Military, Veteran and Family Health* 7, no. 3 (2021).

The overuse of magnetic resonance imaging (MRI) is a specific concern for CFHS with respect to DI ordering due to its greater cost compared to other types of imaging, outsourcing requirement, and potential for "unintended harm" when ordered without sufficient clinical justification.[32,33] Observations of civilian physiotherapist DI referral practices in Alberta, where physiotherapists have been able to order DI since 2011, suggests that current practice patterns do not indicate misuse of MRI ordering by physiotherapists.[34] The practice patterns identified in Alberta indicate that physiotherapists typically order radiographs and ultrasound for MSK conditions. This suggests that concerns over misuse or inappropriate ordering of MRI is likely unwarranted in relation to expanding the DT physiotherapy scope of practice and that most of the potential DI ordered by DT physiotherapists could be managed without need for outsourcing as the commonly ordered DI type (i.e. radiographs) is available in most CFHS clinics where physiotherapy sections are located.[35] It also further supports other findings that physiotherapists adhere to MSK DI guidelines. Although MRI is an extremely potent form of DI, it is often not the initially indicated form of DI for commonly observed MSK conditions.[36] Extending DI ordering privileges to DT physiotherapists is unlikely to lead to increased costs or patient harm but is likely to lead to increased adherence to MSK DI guidelines and reduced patient wait times.

[32] Tracey Pérez Koehlmoos et al., "Assessing low-value health care services in the military health system," *Health Affairs* 38, no. 8 (2019). 1351-1357.

[33] Timothy W Flynn, Britt Smith, and Roger Chou, "Appropriate use of diagnostic imaging in low back pain: a reminder that unnecessary imaging may do as much harm as good," *journal of orthopaedic & sports physical therapy* 41, no. 11 (2011).

[34] Gross et al., "A descriptive study of physiotherapist use of publicly funded diagnostic imaging modalities in Alberta, Canada." 171-174.

[35] Canadian Forces Health Services Group. Rx 2000 – The Canadian Forces Clinic Model. (2000). C-1-3.

[36] McKinnis and Mulligan, *Musculoskeletal Imaging Handbook: A Guide for Primary Practitioners*.

Easing the Burden on Primary Care

Permitting physiotherapists to order DI for MSK conditions would reduce the MSK care burden on the CFHS primary care system and its clinicians. The primary care department in CFHS clinics "quarterbacks" all the medical care provided to CAF members and is the typical point of access for entry into the medical system as well as the primary referral source to other services such as physiotherapy, specialty services, case management, and mental health. It also provides occupational medical services to the CAF. The wait time for a routine booked appointment (i.e. not "sick-parade" and not urgent) in primary care routinely exceeds two weeks.[37] Waiting two weeks for an appointment with a primary care clinician to receive an order for DI is, in many cases, an unnecessary step that further contributes to delay in access to DI and prognosis, delays potential referral to specialty care, and uses appointment slots that may have been more appropriately used by other patients; this further contributes to increased wait times. Primary care clinicians have often dealt with these situations by either "squeezing the member in" during clinical administrative time, "double booking," or by having them attend "sick-parade" to receive a referral. All of these "work-arounds" contribute to increased burden on primary care clinicians, may detract from other important patient care tasks, are not aligned with organizational policy or preferred practice patterns, and contribute to misuse of organizational resources and increased demand on clinicians. These "work-arounds" also make a different patient wait longer for care. Permitting physiotherapists to order MSK relevant DI would reduce the burden on primary care clinicians to use "work-arounds" for patients requiring DI.

[37] Thériault, *Health and lifestyle information survey of Canadian Armed Forces personnel 2013/2014-Regular Force report*.

"Compassion fatigue" and "burnout" are prevalent in military health care providers and "burnout" rates of greater than 37% have been reported in physicians.[38,39] High work loads, lack of collaboration, schedule "disturbances", poor teamwork, and time pressure have been observed to be factors contributing to burnout in primary care clinicians.[40] The DTHWS has highlighted the need to address the wellness of all DT members including medical staff. As DT physiotherapists already function as physician extenders in primary care during "sick-parade" and are often the primary point of contact for MSK conditions, extending DI privileges to DT physiotherapists may help to reduce the impact of factors that contribute to caregiver fatigue and burnout in CFHS primary care clinicians in addition to reducing patient wait times for DI. Also, this initiative may potentially increase the engagement between clinicians and foster collaborative practice as well as inter-professional communication and respect. Because interpreting DI results is not included in the scope of practice of physiotherapists there would be a requirement for DT physiotherapists to clearly communicate with stakeholders to justify DI ordering decisions.[41] This additional layer of accountability may also contribute to the more conservative usage of DI by physiotherapists. Extending DI privileges to DT physiotherapists would contribute to reducing the MSK burden on primary care clinicians and enhance interprofessional collaboration.

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[38] Regina Peterson Owen and Linda Wanzer, "Compassion fatigue in military healthcare teams," *Archives of Psychiatric Nursing* 28, no. 1 (2014). 2-4.

[39] Martha J Hayes, *Compassion fatigue in the military caregiver*, ARMY WAR COLL CARLISLE BARRACKS PA (2009).

[40] Owen and Wanzer, "Compassion fatigue in military healthcare teams." 2-4.

[41] Trudel, "JCSP 47 Master of Defence Studies." 48-58.

Patient-Centered Care

Patient centered care, a concept that is aligned with the intent of SSE[42], proposes that care provided should be respectful of, and responsive to, the needs of the patient and is "enshrined" as a characteristic of high-value care.[43] The current process for patients to access DI after accessing physiotherapy services is not patient centered. For CAF members referred to physiotherapy, DI may be indicated in situations where a patient is not progressing as expected following initial evaluation or when changes in signs or symptoms indicate a requirement for DI or referral for a medical specialist opinion. Currently, this means the patient (i.e. the member) is required to make an appointment with their primary care clinician to be sent for DI and then book a follow-up with, ideally, the same clinician to review the DI results. This process generates, as a minimum, two additional primary care appointments and places increased scheduling demands on the member (unless the primary care physician opts to use "work arounds"). The current system of MSK management, with respect to post-physiotherapy access to DI, is not responsive to the needs of the patient and effectively treats the patient as a passive recipient of appointments to obtain further appointments, may be unnecessarily prolonged, and a source of frustration for members seeking clarity about their health status, prognosis, and potential treatment options. It does not contribute to a "positive patient experience." As outlined by Trudel, patients that require further routine DI following referral to physiotherapy may need to wait more than two weeks for access to a primary care clinician, then wait a further period to review the results before determination if additional referral is warranted and then wait again to access specialty care.[44] In that time, it is possible that a delay in diagnosis could lead to harm, reduced quality of life,

[42] Government of Canada. "Strong, Secure, Engaged: Canada's Defence Policy". (2017).
[43] Ronald M Epstein and Richard L Street, "The values and value of patient-centered care," (Annals Family Med, 2011). 100-103.
[44] Trudel, "JCSP 47 Master of Defence Studies." 48-58.

increased pain, postponement of return to work/duty, deferral of prognosis or access to speciality care if indicated,[45] and disempowers the member as a stakeholder in their own health.

In some CFHS clinics, MSK specialists (i.e. orthopedic surgeons and sports medicine physicians) have permitted DT physiotherapists to directly refer members for assessment (i.e. primary care referral is not required), yet CFHS does not recognize the ability of these same physiotherapists to order the DI the specialists would normally require before initially consulting with a patient. Local processes have been developed using the Canadian Forces Health Information System (CFHIS) to ensure all stakeholders are aware of the decision by a DT physiotherapist to refer to these specialists.[46] A similar process could be utilized to ensure that all stakeholders are informed when a DT physiotherapist refers for DI. As mentioned above, interpreting DI results is not included in the scope of practice of physiotherapists, therefore, there is additional requirement for physiotherapists to clearly communicate with stakeholders to clinically justify DI decisions and to engage those same stakeholders as follow-up to ensure appropriate patient care and communication of findings. Extending DI privileges to DT physiotherapists is a patient centered initiative. It would contribute to reduced wait times, improve the "patient experience," facilitate timely determination of prognosis, respect and respond to the needs of the patient, reduce the impact of MSK conditions on CAF members' quality of life, and lead to timely access to definitive care.

[45] Jodie Ng Fuk Chong et al., "Ordering diagnostic imaging: a survey of Ontario physiotherapists' opinions on an expanded scope of practice," *Physiotherapy Canada* 67, no. 2 (2015). 145-148.

[46] Major A.J. Hannaford, "1 Field Ambulance Physiotherapy Sports Medicine Access Referral Team - SMART," interview by Lieutenant Colonel Peter Rowe, 2018.

Current Situation, Trends, Implementation, and Barriers

Seven Canadian provinces permit the ordering of DI as part of the provincial physiotherapy scope of practice or have health systems that permit physiotherapists to order DI.[47] These provinces, including Alberta, Québec, and Ontario, represent the majority of Canada's population and are "home" to some of the CAF's larger establishments. Currently, a CAF member outsourced for physiotherapy treatment, a routine practice due to demand for physiotherapy services exceeding on-base supply,[48] could be referred for DI by a civilian physiotherapist that holds equivalent licensure and qualifications as DT physiotherapists. This discrepancy may contribute to mistrust in the expertise of DT physiotherapists and CFHS. For many DT physiotherapists, all of whom are licensed by a provincial governing body, ordering DI is already within their provincial scope of practice, however, being employed within CFHS limits their practice. This has been reported as a dissatisfier by DT physiotherapists to the Physiotherapy National Practice Leader[49] and may pose a threat to recruitment and retention for both military and civilian staff. While there are variances between provinces, the utility of physiotherapists as physician extenders with MSK related DI ordering privileges is increasingly recognized and widespread.[50]

As CFHS is a separate healthcare system, it has the authority to determine the "scope" and requirements of physiotherapists with respect to ordering DI.[51] To modify the limitations imposed on physiotherapy practice in CFHS, Clinical Council would have to agree to revise the

[47] Trudel, "JCSP 47 Master of Defence Studies." 48-58.
[48] Ibid.
[49] Lieutenant Colonel Trudel, R.D. Discussion with Regional Physiotherapy Practice Leaders. Canadian Armed Forces Physiotherapy Strategic Planning. (March, 2022).
[50] Keil et al., "Ordering of diagnostic imaging by physical therapists: a 5-year retrospective practice analysis." 1046.
[51] Trudel, "JCSP 47 Master of Defence Studies." 48-58.

physiotherapy scope of practice policy and extend DI privileges to DT physiotherapists. Subsequently, the Canadian Forces Manual of Military Employment Structure would need to be revised to include ordering DI as part of the Physiotherapy Officer (PTO) Job Based Specification to reflect the change in PTO specifications. DI Sections in CFHS clinics would need to revise policies regarding DI ordering privileges. Trudel has outlined means to integrate the ordering of DI by physiotherapists into the CFHS that addresses concerns about inter-professional communication, training, patient safety, and accountability.[52] While additional professional training is required by some provinces for physiotherapists to order DI,[53] there are few barriers to accessing training programs as they are offered by accredited institutions that have existing relationships with the Department of National Defense and the CAF (e.g. University of Alberta School of Physiotherapy).[54] The largest barrier to DI ordering by DT physiotherapists is the discrepancy in ordering privileges between provinces. This barrier could be addressed by limiting DT physiotherapist DI ordering privileges to "in-house" procedures (i.e. only procedures within CFHS) or through engagement by CFHS with provincial stakeholders to develop acceptable means to expand the role of DT physiotherapists.

Conclusion

Physiotherapists are experts in MSK management whose full scope of practice and potential as physician extenders remains untapped by CFHS. Expanding DT physiotherapists' scope of practice to include ordering of DI would improve the use of organizational resources, would align CFHS more so with civilian healthcare systems in Canada, reduce the burden on

[52] Trudel, "JCSP 47 Master of Defence Studies." 48-58.
[53] B. Stefanov, Business Case Supporting the Ordering of Diagnostic Imaging by Canadian Armed Forces Physiotherapists, 2021.
[54] University of Alberta School of Physiotherapy, "Diagnostic Imaging for MSK Disorders in Primary Care."

primary care clinicians, and is a patient centered approach that would improve the "patient experience." Concerns over inappropriate use of DI by physiotherapists have not been identified as a professional practice issue across settings. CFHS currently possesses the means to ensure appropriate interprofessional communication, patient safety, and accountability. The scope of practice of DT physiotherapists should be expanded to include ordering DI.

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