Understanding Medical Assessment and Diagnosis of Concussion in Canada

Summary
Recommendations that all patients and athletes with a suspected concussion undergo urgent medical assessment have been outlined by numerous evidence-based national and international guidelines. The *Canadian Guideline on Concussion in Sport* provides harmonized recommendations that align with these sources and promotes the highest standard of care for all Canadians who sustain these injuries.

In order to conduct a medical assessment in patients with suspected concussion, a clinician must be independently qualified and licensed to carry all aspects of the assessment and must have the relevant medical training to do so. It is not uncommon for patients who present with neurological symptoms following head injury to have other medical conditions (stroke, demyelinating disease, infections, hypertension, spine injuries, vestibular disorders, epilepsy) that account for these symptoms (Leddy et al., 2012). As such, the clinician conducting the medical assessment must have a strong foundation of competency-based training in medicine, must be licensed to order and clinically interpret all necessary diagnostic tests (MRI, EEG, bloodwork, etc.) and must be licensed to initiate referrals to other medical sub-specialists in Canada that can address urgent medical conditions that occur in patients with acute head and neck trauma (i.e., neurosurgeons, neuro-ophthalmologists, neurologists). If patients are initially evaluated by clinicians who do not satisfy these requirements it can lead to diagnoses that are missed or can result in a delay in the definitive management of potentially life-threatening conditions that can occur in this patient population (stroke, meningitis, demyelinating disease, epilepsy, etc.).

In general, in Canada, the only healthcare professionals with training in medicine and who are licensed to independently conduct medical assessments in patients with head injury (including conducting a clinical history and physical examination, ordering diagnostic tests as needed, and initiating referrals to medical sub-specialists) are medical doctors (M.D.’s) and nurse practitioners. There are some exceptions within certain provinces and territories. For example, in Quebec, nurse practitioners cannot make a clinical diagnosis of concussion and in Manitoba physician assistants are licensed to conduct medical assessments.
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The Canadian Guideline on Concussion in Sport promotes the involvement of various licensed healthcare professionals in the spectrum of concussion care, including initial sideline assessment, the Return-to-School and Sport Strategies, and medically-supervised multi-disciplinary care for patients with persistent symptoms. For in-office or in-hospital medical assessment and diagnosis, the Canadian Guideline specifically recommends these be conducted by a medical doctor or nurse practitioner. The content that follows presents a detailed rationale for this recommendation, based on evidence-based guidance and current scope of practice in Canada.

Given there is currently no gold standard test to diagnose a concussion, concussion remains a clinical diagnosis (i.e., a diagnosis made on the basis of medical signs and patient-reported symptoms, rather than diagnostic tests) that can only be made following a comprehensive medical assessment. Recommendations that all patients and athletes with a suspected concussion undergo urgent medical assessment have been outlined by numerous national and international guidelines. The Canadian Guideline on Concussion in Sport (Parachute, 2017) states, in order to provide comprehensive evaluation of athletes with a suspected concussion, the medical assessment:

- must rule out more serious forms of traumatic brain and spine injuries,
- must rule out medical and neurological conditions that can present with concussion-like symptoms, and
- must make the diagnosis of concussion based on findings of the clinical history and physical examination and the evidence-based use of adjuncive tests as indicated (i.e., CT scan)

These recommendations align with those from the 5th International Consensus Statement on Concussion in Sport (McCrory et. al., 2017). The Concussion in Sport Group is a multi-disciplinary group composed of the world’s experts in concussion including physicians, neuropsychologists, and physiotherapists. The Consensus Statement states:

An athlete with [sport-related concussion] may be evaluated in the emergency room or doctor’s office as a point of first contact after injury or may have been referred from another care provider. In addition to the points outlined above, the key features of follow-up examination should encompass:

a. A medical assessment including a comprehensive history and detailed neurological examination including a thorough assessment of mental status, cognitive functioning, sleep/wake disturbance, ocular function, vestibular function, gait and balance.

b. Determination of the clinical status of the patient, including whether there has been improvement or deterioration since the
time of injury. This may involve seeking additional information from parents, coaches, teammates and eyewitnesses to the injury.

c. Determination of the need for emergent neuroimaging to exclude a more severe brain injury (e.g., structural abnormality). (McCrory et al., 2017)

These recommendations also align with those from the Canadian Concussion Collaborative’s document entitled, 4 Characteristics of a Good Concussion Clinic. This is a multi-disciplinary group with representation from numerous Canadian licensed healthcare professional organizations representing family and sports medicine physicians, neurosurgeons, occupational therapists, physiotherapists and chiropractors. The document reads,

The treatment of patients with persistent concussion symptoms may involve many health care professionals, but a physician should ideally do the initial assessment of patients and should direct patient care and provide final medical clearance to return to sport, school and work-related activities. Clinics offering concussion care should have timely access to physicians with training and experience in concussion. These physicians should be identified by name. (Canadian Concussion Collaborative, 2017)

These recommendations are in alignment with those from the Ontario Neurotrauma Foundation’s Standards for Post-Concussion Care that were published by multi-disciplinary experts in concussion and traumatic brain injury and were externally reviewed by numerous provincial licensed healthcare professional regulatory bodies. The Standards recommend,

The diagnosis of concussion is a clinical diagnosis based on observed symptoms, mechanism of injury and clinical history. Symptoms can be physical, cognitive, social/emotional and must be considered when making a diagnosis. Physicians, nurse practitioners and neuropsychologists are able to diagnose a concussion; however, it is important that a medical assessment be conducted first to ensure medical stability.

[…]

Every patient who is suspected to have had a concussion should be assessed by a qualified practitioner able to make a diagnostic decision (physician, nurse practitioner, or neuropsychologist).

[…]

Post-concussion care and concussion clinics should have direct access to a physician with experience in concussion management to provide ongoing involvement regarding medical stability, trajectory of care, need for medical specialty referral and decisions on clearance to return to activity. (This can be provided through a physician working in a clinic or a physician associated through a formal arrangement.) (ONF, 2017)

Furthermore, the recommendations align with those outlined in the recently
released Ontario Neurotrauma Foundation *Guideline for Concussion/Mild Traumatic Brain Injury & Persistent Symptoms: 3rd edition*. The Guideline states, “The purpose of the initial medical assessment is to establish the diagnosis of concussion/mTBI by ruling out more severe forms of TBI, cervical spine injuries and medical and neurological conditions that can present with concussion-like symptoms.” (ONF, 2018: 12) The Guideline further differentiates between concussion recognition and diagnosis, “Concussion should be recognized and diagnosed as soon as possible to improve positive health outcomes for patients. Concussion can be recognized in the community by a non-medical professional, whereas diagnosis should be made by a physician/ nurse practitioner.” (ONF, 2018: 14) It should be noted this latter recommendation is supported by Level A evidence (i.e., the highest level of evidence), meaning it is supported by at least one meta-analysis, systematic review, or randomized controlled trial of appropriate size with relevant control group.

In order to conduct a medical assessment in patients with suspected concussion, a clinician must be independently qualified and licensed to carry all aspects of the assessment and must have the relevant medical training to do so. It is not uncommon for patients who present with neurological symptoms following head injury to have other medical conditions (stroke, demyelinating disease, infections, hypertension, spine injuries, vestibular disorders, epilepsy) that account for these symptoms. As such, the clinician conducting the medical assessment must have a strong foundation of competency-based training in medicine, must be licensed to order and clinically interpret all necessary diagnostic tests (MRI, EEG, bloodwork, etc.) and must be licensed to initiate referrals to other medical sub-specialists in Canada that can address urgent medical conditions that occur in patients with acute head and neck trauma (i.e., neurosurgeons, neuro-ophthalmologists, neurologists). If patients are initially evaluated by clinicians who do not satisfy these requirements it can lead to diagnoses that are missed or can result in a delay in the definitive management of potentially life-threatening conditions that can occur in this patient population (stroke, meningitis, demyelinating disease, epilepsy, etc.).

In general, in Canada, the only healthcare professionals with training in medicine and who are licensed to independently conduct medical assessments in patients with head injury (including conducting a clinical history and physical examination, ordering diagnostic tests as needed, and initiating referrals to medical sub-specialists) are medical doctors (M.D.’s) and nurse practitioners. There are some exceptions within certain provinces and territories. For example, in Quebec, nurse practitioners cannot make a clinical diagnosis of concussion and in Manitoba physician assistants are licensed to conduct medical assessments. Although some other health professions such as athletic therapy, physiotherapy, neuropsychology and chiropractic are suggested as practitioners
that can render their own version of a concussion “diagnosis”, they are not independently licensed to meet all the criteria necessary to conduct a medical assessment in a patient presenting with neurological symptoms following head and neck trauma (as outlined by numerous national and international consensus guidelines on concussion and traumatic brain injury) in Canada. This is a very important distinction that is well known, but not always acknowledged, in discussions about concussion medical assessment and diagnosis.

It should be recognized, however, that despite these limitations, independent providers and advertised “concussion clinics” are indeed offering medical assessments and services to Canadian concussion patients without proper medical training and without the on-site supervision of medical doctors. Indeed, a recent study examining concussion healthcare providers and clinics in Canada found that only 40% of advertised concussion healthcare providers and facilities advertised on-site access to a medical doctor who, as stated above, is recommended to provide the initial medical assessment and medical clearance of patients with diagnosed and suspected concussion (Ellis et al., 2017). In comparison, over 80% of concussion clinics and providers in the United States advertise on-site access to medical doctors (Ellis et al., 2017).

Some companies in Canada are also providing their own unregulated “certification” for healthcare professionals that allows them to advertise themselves as a “certified” concussion provider after completing only a two- to three-day course provided by an expert with no nationally licensed training in a traumatic brain injury sub-discipline (i.e., neurosurgery, neuropsychology, neurology). Furthermore, there is also widespread concern among experts in concussion and traumatic brain injury that these clinics have turned concussion care in Canada into a business that targets a vulnerable patient population and is offering non-evidence-based services (such as widespread baseline testing) to thousands of Canadians. CBC News highlighted this issue in a 2016 story: https://www.cbc.ca/news/health/concussion-hotline-baseline-testing-treatment-industry-for-profit-unregulated-1.3833158.

It is these concerns about the current landscape of concussion care in Canada that prompted experts to develop the Standards on Post-Concussion Care and the 4 Characteristics of a Good Concussion Clinic documents that recommend all concussion patients undergo initial medical assessment and medical clearance by medical doctors. To address the widespread use of non-evidence-based baseline testing, Parachute also released a document entitled, Statement on Concussion Baseline Testing in Canada.

Taken together, there is strong consensus among the national and international guidelines listed above that all patients with a suspected concussion undergo urgent medical assessment. The Canadian Guideline on Concussion in Sport
provides harmonized recommendations that align with these sources and promotes the highest standard of care for all Canadians who sustain these injuries.

References Cited


