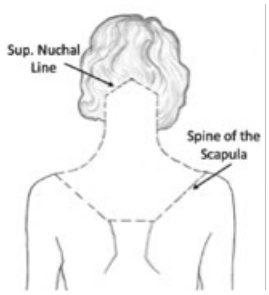
SECTION 4.0

GUIDELINE FOR THE CLINICAL MANAGEMENT OF NECK PAIN AND ASSOCIATED DISORDERS (NAD)

This evidence-based guideline establishes the best practice for the clinical management of neck pain and its associated disorders (NAD)* that is caused or exacerbated by a motor vehicle collision. This guideline covers recent onset (0-3 months post-collision) and persistent (4-6 months post-collision) NAD grades I-III; it does not cover NAD that persists for more than 6 months post-collision. This guideline encompasses recommendations for the management of musculoskeletal thoracic spine and chest wall pain.

In this guideline, the neck is defined as the region that extends from the base of the skull to top of the shoulder blades and the mid-thoracic spine (Figure 4.1). Moreover, this guideline addresses symptoms that radiate or are referred from the neck to the head, arms or trunk.

Figure 4.1 Body mannequin



NAD I-III refers to neck pain, stiffness or tenderness not attributed to pathology such as fractures, dislocations, infections or tumours*. This guideline is not indicated for conditions that include the presence of major structural or other pathological causes of NAD.

NAD can be classified into four grades, distinguished by the severity of symptoms, signs and impact on activities of daily life (Table 4.A).

NAD is the most common condition resulting from motor vehicle collisions. In Canada, 86.2%[+] of people involved in motor vehicle collisions develop NAD. Although the primary symptom of NAD is neck pain, it also includes physical and psychological symptoms, such as back pain, headaches, arm pain, temporomandibular disorders and depressive symptomatology. Most people recover from NAD.

* According to the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and its Associated Disorders, NAD includes Whiplash-associated Disorders (WAD). Guzman J, Hurwitz E, Carroll L, Haldeman S, Côté P, Carragee E, Peloso P, van der Velde G, Holm L, Hogg-Johnson S, Nordin M, Cassidy JD. A New Conceptual Model of Neck Pain: Linking Onset, Course and Care. The Bone and Joint Decade 2000-2010 Task Force on Neck Pain and its Associated Disorders. Spine. 2008; 33 (4S): S14-S23.

[+] Hincapié C, Cassidy JD, Côté P, Carroll LJ, Guzmán J. Whiplash injury is more than neck pain: a population-based study of pain localization after traffic injury. JOEM. 2010; 52:434-440.

4.0 GUIDELINE FOR THE CLINICAL MANAGEMENT OF NECK PAIN AND ITS ASSOCIATED DISORDERS (NAD)

Table 4.A The 2000-2010 Bone and Joint Decade Task Force on Neck Pain and its Associated Disorders Classification of NAD

Grade	Definition
I	No signs or symptoms suggestive of major structural pathology and no or minor interference with activities of daily living
II	No signs or symptoms of major structural pathology, but major interference with activities of daily living
III	No signs or symptoms of major structural pathology, but presence of neurologic signs such as decreased deep tendon reflexes, weakness or sensory deficits
IV	Signs or symptoms of major structural pathology

The clinical management recommended in this guideline aims to: 1) accelerate recovery; 2) reduce the intensity of symptoms; 3) promote early restoration of function; 4) prevent chronic pain and disability; 5) improve health-related quality of life; 6) reduce recurrences; and 7) promote active participation of patients in their care.

Patient-centered care is an internationally recognized principle that was fundamental to the development of this guideline. This guideline reinforces the importance of communication and partnership between patients and health care professionals.

Patients with multiple injuries should be managed using all appropriate care pathways. For example, a patient who suffers from neck and low back pain should also be managed according to the recommendations included in the NAD and low back pain care pathways.

All recommendations included in this guideline are based on studies with a low risk of bias.

Interventions not described in this guideline are not recommended for the management of patients with NAD because of a lack of evidence about their effectiveness and safety.

Health care professionals eligible to provide care under this guideline are those defined by the Statutory Accident Benefits Schedules (SABS).

This guideline is organized into two sections. Each section provides evidence-based recommendations for the clinical management of various grades and durations of NAD:

- Section 4.1 - Management of NAD I-II
- Section 4.2 - Management of NAD III

4.0 GUIDELINE FOR THE CLINICAL MANAGEMENT OF NECK PAIN AND ITS ASSOCIATED DISORDERS (NAD)

All recommendations presented in this guideline integrate the:

- Key decision determinants based upon the framework developed by the Ontario Health Technology Advisory Committee (OHTAC);
- Best evidence obtained from a critical review of current scientific literature; and
- Qualitative research exploring the experiences of persons treated for traffic injuries in Ontario

All background documents and references are available at www.fsco.gov.on.ca

Quick Reference Guide – Management of NAD Grade I and II

Symptoms ≤ 3 months post-collision	Symptoms > 3 months post-collision
For all injured persons with NAD I and II: **Rule out** risk factors for serious pathologies[a] **Assess** for factors delaying recovery: prior history of collision-related NAD, older age, high levels of initial pain, post-crash psychological factors [poor recovery expectation, depressed mood, anxiety or fear about pain, kinesiophobia, acute stress disorder (symptoms ≤ 4 weeks from injury), post-traumatic stress disorder (symptoms > 4 weeks), high levels of frustration or anger about pain, passive coping] **Offer** information on nature, management, course of collision-related NAD as a framework for initiation of a program of care **Conduct** ongoing assessment for symptom improvement or progression during intervention and refer accordingly **Reassess and Monitor** for presence of acute stress disorder, post-traumatic stress disorder, kinesiophobia, passive coping, depression, anxiety, anger, frustration, and fear **Discharge** injured person as appropriate at any point during intervention and recovery	
Based upon shared decision making between the patient and provider, the following therapeutic interventions are recommended:[b,c] **Home and clinic based interventions:** Structured education (advice to stay active), reassurance and **one of the following**: 1. Unsupervised neck range of motion exercises 2. Multimodal care that includes the combination of: a) unsupervised neck range of motion exercises b) manipulation or mobilization 3. Muscle relaxants[d] **Refer to specific recommendation for treatment details (Section 4.1.3)**	**Based upon shared decision making between the patient and provider, the following therapeutic interventions are recommended:[b,c]** **Home and clinic based interventions:** Structured education (advice to stay active) reassurance and **one of the following:** 1. Supervised combined exercises 2. Supervised qigong exercises 3. Iyengar yoga 4. Multimodal care that includes the combination of (if not previously given in 1st 3 months of care): a) Neck range of motion exercises b)Manipulation or mobilization 5. Clinical massage 6. Low-level laser therapy 7. Non-steroidal anti-inflammatory drugs[d] **Refer to specific recommendation for treatment details (Section 4.1.4)**
Do Not Offer:[e] • Structured patient education alone, in either verbal or written formats • Strain-counterstrain or relaxation massage • Cervical collar • Electroacupuncture (electrical stimulation of acupuncture points with acupuncture needles or electrotherapy applied to the skin) • EMS, heat (clinic-based)	**Do Not Offer:[e]** • Programs solely of clinic-based supervised high dose strengthening exercises • Strain-counterstrain or relaxation massage • Relaxation therapy for pain or disability outcomes • TENS, EMS, pulsed shortwave diathermy, heat (clinic-based) • Electroacupuncture (electrical stimulation of acupuncture points with acupuncture needles or electrotherapy applied to the skin) • Botulinum toxin injections
Outcome: **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Initiate persistent protocol **Signs progress to Grade III → NAD III care pathway** **Development of serious pathology (new or worsening physical, mental or psychological symptoms) → Refer to physician**	**Outcome:** **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Refer to physician **Signs progress to Grade III → NAD III care pathway** **Development of serious pathology (new or worsening physical, mental or psychological symptoms) → Refer to physician**

[a] Risk factors for serious pathologies (also known as red flags): Cancer (history of cancer, unexplained weight loss, nocturnal pain, age >50), vertebral infection (fever, intravenous drug use, recent infection), osteoporotic fractures (history of osteoporosis, use of corticosteroid, older age), traumatic fracture (positive Canadian C-Spine rule), myelopathy – severe/progressive neurological deficits (painful stiff neck, arm pain and weakness, sensory changes in lower extremity, motor weakness and atrophy, hyper-reflexia, spastic gait), carotid/vertebral artery dissection (sudden and intense onset of headache or neck pain), brain haemorrhage/mass lesion (sudden and intense onset of headache), inflammatory arthritis (morning stiffness, swelling in multiple joints)

[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness

[c] The ordering of interventions does not reflect superiority of effectiveness

[d] The evidence indicates that analgesia is the primary therapeutic benefit of the muscle relaxant and NSAID classes of medication. Pain reduction should be apparent during the initial period of usage; in the absence of therapeutic benefit, prolongation of usage is not warranted. There is no evidence of differential efficacy for the various drugs within each class. There is also no evidence that any combination of these medications provides added benefit. There are potentially significant adverse effects associated with use of these classes of medications. Finally, the non-opioid first 'step' in the Analgesic Ladder includes NSAIDs, muscle relaxant and acetaminophen (Vargas-Schaffer G. Is the WHO analgesic ladder still valid? Twenty-four years of experience. Vol 56: June 2010 Canadian Family Physician). However, the evidence does not indicate that acetaminophen is an effective analgesic for either NAD or low back pain; therefore, the use of acetaminophen is not recommended.

[e] Based on evidence of no benefit to patients

The care pathway is presented in Figure 4.2.

At initial contact, health care professionals should educate and reassure the patient that NAD will resolve within a few months of symptom onset. Patients greatly improve their recovery by actively participating in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first three months of care for NAD I-II is described below.

Assess the Patient and Classify NAD

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. Cervical spine fractures and dislocations can be ruled out using the Canadian C-spine rule (Appendix 4.A). The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the NAD care pathway.

Assess neurological signs (decreased deep tendon reflexes, muscle weakness or sensory deficits).

If neurological signs are present, the patient should be managed under the "Care Pathway for the Management of NAD III" (see section 4.2).

Classify the grade of NAD as grade I or II (Table 4.A).

Assess the Prognostic Factors

Assess the prognostic factors for delayed recovery. Most patients recover from their injury. Patients with Grade I NAD are expected to recover the most quickly, while those with NAD III are expected to recover the most slowly. Patients with the following prognostic factors may have a higher risk for delayed recovery:

- Prior history of NAD related to a motor vehicle collision
- Older age
- High levels of initial pain
- ***Post-collision*** psychological factors:
  - Poor expectation of recovery
  - Depressed mood, feelings of depression about the pain
  - Anxiety or fear about pain, kinesiophobia or avoiding activities due to fear of pain
  - Symptoms of acute stress disorder (symptoms exhibited within 4 weeks of the injury)/post -traumatic stress disorder (symptoms lasting at least 4 weeks)
  - High levels of frustration or anger about the pain
  - Passive coping

Examples of questions or questionnaires to assess the prognostic factors for delayed recovery can be found in Appendix 4.B.

Table 4.B Risk factors of serious pathology (red flags) for neck pain

Possible cause	Risk factors of serious pathology identified during history or physical examination*
Fracture/dislocation	• Positive Canadian C-spine rule
Cancer	• History of cancer • Unexplained weight loss • Nocturnal pain • Age > 50
Vertebral infection	• Fever • Intravenous drug use • Recent infection
Osteoporotic fractures	• History of osteoporosis • Use of corticosteroid • Older age
Myelopathy - Severe/progressive neurological deficits	• Painful stiff neck • Arm pain and weakness • Sensory changes in lower extremity • Motor weakness and atrophy • Hyper-reflexia • Spastic gait
Carotid/vertebral artery dissection	• Sudden and intense onset of headache or neck pain
Brain haemorrhage/mass lesion	• Sudden and intense onset of headache
Inflammatory arthritis	• Morning stiffness • Swelling in multiple joints

* This list of risk factors of serious pathology was informed from the following peer reviewed articles rather than being developed from a systematic review of the literature on "red flags":
Chou R, Qaseem A, Snow S, Casey D, Cross JT, Shekelle P, Owens DK for the Clinical Efficacy Assessment Subcommittee of the American College of Physicians and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel. Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147: 478-491.
Downie A, Williams CM, Henschke N, Hancock MJ, Ostelo RWJG, de Vet HC, Macaskill P, Irwig L, van Tulder MW, Koes BW, Maher CG. Red flags to screen for malignancy and fracture in patients with low back pain: systematic review. BMJ 2013;347:f7095 doi: 10.1136/bmj.f7095); 75.
Nordin M, Carragee, EJ, Hogg-Johnson S, Schecter Weiner S, Hurwitz EL, Peloso PM, Guzman J, van der Velde G, Carroll LJ, Holm LW, Côté P, Cassidy JD, Haldeman S. Assessment of neck pain and its associated disorders. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and its Associated Disorders. Spine. 2008; 33 (4S): S101-S122.

Educate and Reassure the Patient

Develop a patient-centred care plan in partnership with the patient.

Health care professionals need to reassure patients that there are no major structural or progressive pathologies (NAD IV) in their neck.

Prognostic factors for poor recovery should be addressed when present. The care should start with education

and reassurance about the benign and self-limited nature of NAD I-II and the importance of maintaining activity and movement. This is particularly important when the patient reports poor expectation of recovery.

It is also important to reassure patients that it is normal to feel some anxiety, distress or anger following a traffic collision. In the presence of such symptoms or emotions, the health care professional should listen to the patient's concerns, discuss them and adjust the care plan accordingly.

Determine if Ongoing Clinical Care is Necessary

Health care professionals should first determine if the patient requires ongoing clinical care. Patients with Grade I - II NAD may not require ongoing clinical care. Rather, patients can be managed with reassurance, education, home stretching, and neck range of motion exercises.

Deliver the Care Plan for Recent onset NAD (0-3 months post-collision)

Patients who require ongoing clinical care should be encouraged to actively participate in their care by staying active, doing neck stretching, and range of motion exercises on a regular basis. Based upon shared decision making between the patient and provider, structured education (advice to stay active) reassurance and one of the following therapeutic interventions are recommended:

- Unsupervised neck range of motion exercise alone; or
- A short course of multimodal care that includes the combination of manipulation or mobilization and unsupervised neck range of motion exercises
- Muscle relaxants

Interventions that are not recommended include:

- Structured patient education alone (either verbal or written)
- Strain-counterstrain or relaxation massage
- Cervical collar
- Electroacupuncture (electrical stimulation of acupuncture points with acupuncture needles or electrotherapy applied to the skin)
- EMS, Heat (Clinic-based)

Discuss the risks and benefits of the care plan with the patient.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered. Patients who have not recovered should follow the care pathway outlined in the guideline.*

* The use of a valid and reliable condition-specific instrument (e.g., Neck Disability Index) is encouraged but should not be used to measure overall recovery.

Patients who develop NAD III should be managed according to the care pathway for the management of NAD III (section 4.2).

Patients with worsening of symptoms and those who develop new symptoms (other than NAD III) should be referred to a physician for further evaluation.

Patients who have not significantly improved or recovered within the first 3 months after the traffic collision should enter the care pathway for persistent NAD I-II described in section 4.1.2.

SECTION 4.1.2

CARE PATHWAY FOR PERSISTENT NAD I-II (4-6 MONTHS POST-COLLISION)

The care pathway is presented in Figure 4.2.

Patients who still experience symptoms and disability more than 3 months after the injury may benefit from receiving additional clinical care. The primary goals of the clinical care are to promote recovery by reducing symptoms and return patients to their normal activities of daily living. The care plan should focus on exercise and movement, but can be supplemented by a short course of passive care.

Assess the Patient and Classify NAD

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. Cervical spine fractures and dislocations can be ruled out using the Canadian C-spine rule (Appendix 4.A). The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the NAD care pathway.

Assess neurological signs (decreased deep tendon reflexes, muscle weakness or sensory deficits).

If neurological signs are present, the patient should be managed under the “Care Pathway for the Management of NAD III” (see section 4.2).

Classify the grade of NAD as grade I or II (see Table 4.A).

Assess the Prognostic Factors

Assess the prognostic factors for delayed recovery. Most patients recover from their injury. Patients with Grade I NAD are expected to recover the most quickly, while those with NAD III are expected to recover the most slowly. However, patients with the following prognostic factors may have a higher risk for delayed recovery:

- Prior history of NAD related to a motor vehicle collision
- Older age
- High levels of initial pain

- ***Post-collision*** psychological factors:
  - Poor expectation of recovery
  - Depressed mood, feelings of depression about the pain
  - Anxiety or fear about pain, kinesiophobia or avoiding activities due to fear of pain
  - Symptoms of acute stress disorder (symptoms exhibited within 4 weeks of the injury)/post-traumatic stress disorder (symptoms lasting at least 4 weeks)
  - High levels of frustration or anger about the pain
  - Passive coping

Examples of questions or questionnaires recommended to assess the prognostic factors for delayed recovery are available in Appendix 4.B.

Educate and Reassure the Patient

Develop a patient-centred care plan in partnership with the patient.

Health care professionals need to reassure patients that there are no major structural or progressive pathologies (NAD IV) in their neck.

Prognostic factors for poor recovery should be addressed when present. The care should start with education and reassurance about the benign and self-limited nature of NAD I-II and the importance of maintaining activity and movement. This is particularly important when the patient reports poor expectation of recovery.

It is also important to reassure patients that it is normal to feel some anxiety, distress or anger following a traffic collision. In the presence of such symptoms or emotions, the health care professional should listen to the patient's concerns, discuss them and adjust the care plan accordingly.

Deliver the Care Plan

The goal of the care plan is to promote activity through exercise and clinical interventions that promote resolution of symptoms and restoration of function. Patients requiring clinical care should be encouraged to participate in their program of care by remaining active and doing neck stretching and range of motion exercises on a regular basis.

Health care professionals should discuss treatment options with their patients and, through a process of shared decision making, determine which therapeutic option they wish to pursue. Based upon the shared decision making between the patient and provider, structured education (advice to stay active) reassurance and one of the following therapeutic interventions are recommended:

- Supervised combined exercises for the neck (range of motion, strengthening, and flexibility)
- Qigong
- Iyengar yoga
- A short course of multimodal care that includes the combination of manipulation or mobilization and unsupervised neck range of motion exercises. Multimodal care should not be offered to those patients who had previously received multimodal care in the first 3 months post-collision. However, a second course could be indicated if the patient demonstrates ongoing and significant improvement.

- A short course of clinical massage
- Low level laser therapy
- Non-steroidal anti-inflammatory drugs

Interventions that are not recommended include:

- Programs solely of clinic-based supervised high dose strengthening exercises
- Strain-counterstrain or relaxation massage
- Relaxation therapy for pain or disability outcomes
- TENS, EMS, pulsed shortwave diathermy, heat (clinic-based)
- Electroacupuncture (electrical stimulation of acupuncture points with acupuncture needles or electrotherapy applied to the skin)
- Botulinum toxin injections

Discuss the risks and benefits of the care plan with the patient.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered. Patients who have not recovered should follow the care pathway outlined in the guideline.*

Patients who develop NAD III should be managed according to the care pathway for the management of NAD III (section 4.2).

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms (other than NAD III) should be referred to a physician for further evaluation at any time point during their care. Patients who have not improved significantly or recovered should be referred to their physician for further evaluation.

* The use of a valid and reliable condition-specific instrument (e.g., Neck Disability Index) is encouraged but should not be used to measure overall recovery.

Table 4.B Risk factors of serious pathology (red flags) for neck pain

Possible cause	Risk factors of serious pathology identified during history or physical examination*
Fracture/dislocation	• Positive Canadian C-spine rule
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Vertebral infection	• Fever • Intravenous drug use • Recent infection
Osteoporotic fractures	• History of osteoporosis • Use of corticosteroid • Older age
Myelopathy - Severe/progressive neurological deficits	• Painful stiff neck • Arm pain and weakness • Sensory changes in lower extremity • Motor weakness and atrophy • Hyper-reflexia • Spastic gait
Carotid/vertebral artery dissection	• Sudden and intense onset of headache or neck pain
Brain haemorrhage/mass lesion	• Sudden and intense onset of headache
Inflammatory arthritis	• Morning stiffness • Swelling in multiple joints

* This list of risk factors of serious pathology was informed from the following peer reviewed articles rather than being developed from a systematic review of the literature on "red flags":

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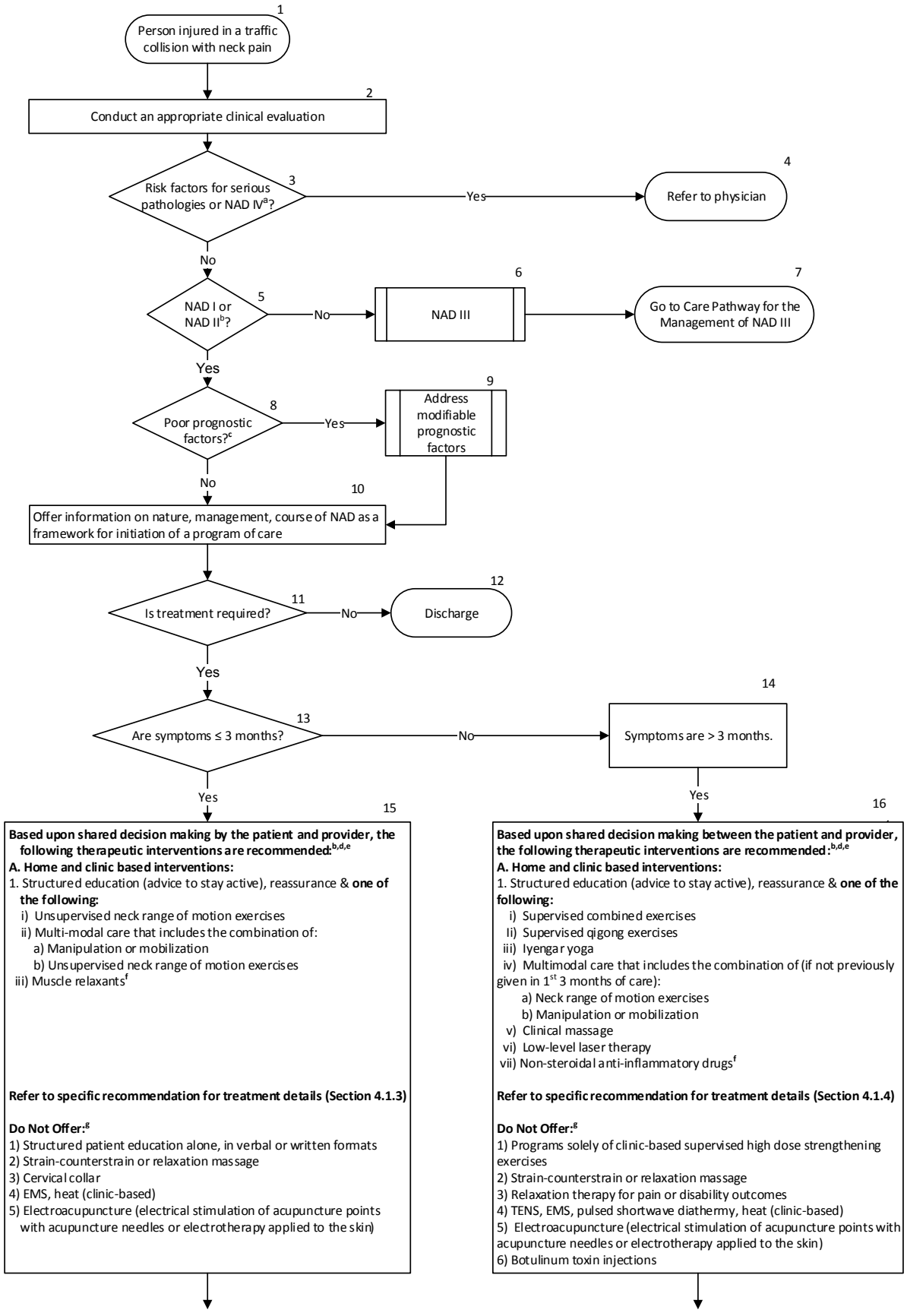
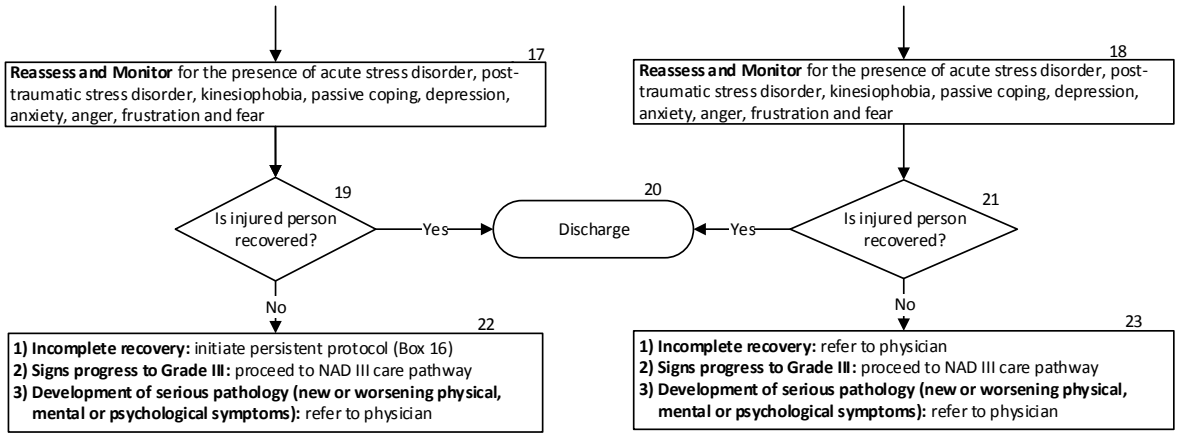
Nordin M, Carragee, EJ, Hogg-Johnson S, Schecter Weiner S, Hurwitz EL, Peloso PM, Guzman J, van der Velde G, Carroll LJ, Holm LW, Côté P, Cassidy JD, Haldeman S. Assessment of neck pain and its associated disorders. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and its Associated Disorders. Spine. 2008; 33 (4S): S101-S122.

Figure 4.2: Care Pathway for the Management of NAD Grade I and II



4.1.2 CARE PATHWAY FOR PERSISTENT NAD I-II (4-6 MONTHS POST-COLLISION)



[a] Risk factors for serious pathologies (also known as red flags): Cancer (history of cancer, unexplained weight loss, nocturnal pain, age >50), vertebral infection (fever, intravenous drug use, recent infection), osteoporotic fractures (history of osteoporosis, use of corticosteroid, older age), traumatic fracture (positive Canadian C-Spine rule), myelopathy – severe/progressive neurological deficits (painful stiff neck, arm pain and weakness, sensory changes in lower extremity, motor weakness and atrophy, hyper-reflexia, spastic gait), carotid/vertebral artery dissection (sudden and intense onset of headache or neck pain), brain haemorrhage/mass lesion (sudden and intense onset of headache), inflammatory arthritis (morning stiffness, swelling in multiple joints)

[b] If symptoms progress proceed to NAD III protocol or refer.

[c] Factors delaying recovery: prior history of collision-related NAD, older age, high levels of initial pain, post-crash psychological factors [poor recovery expectation, depressed mood, anxiety or fear about pain, kinesiophobia, acute stress disorder (symptoms ≤ 4 weeks of the injury), post-traumatic stress disorder (symptoms > 4 weeks), high levels of frustration or anger about pain, passive coping]

[d] This guideline does not include interventions for which there is a lack of evidence of effectiveness

[e] The ordering of interventions does not reflect superiority of effectiveness

[f] The evidence indicates that analgesia is the primary therapeutic benefit of the muscle relaxant and NSAID classes of medication. Pain reduction should be apparent during the initial period of usage; in the absence of therapeutic benefit, prolongation of usage is not warranted. There is no evidence of differential efficacy for the various drugs within each class. There is also no evidence that any combination of these medications provides added benefit. There are potentially significant adverse effects associated with use of these classes of medications. Finally, the non-opioid first 'step' in the Analgesic Ladder includes NSAIDs, muscle relaxant and acetaminophen (Vargas-Schaffer G. Is the WHO analgesic ladder still valid? Twenty-four years of experience. Vol 56: June 2010 Canadian Family Physician). However, the evidence does not indicate that acetaminophen is an effective analgesic for either NAD or low back pain; therefore, the use of acetaminophen is not recommended.

[g] Based on evidence of no benefit to patients

SECTION 4.1.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT ONSET NAD I-II

This section summarizes the key recommendations for the management of NAD I-II for the first 3 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 4.1.3.1

STRUCTURED PATIENT EDUCATION

Structured patient education aims to enable individuals to make informed decisions about their personal health-related behaviour. Structured education strategies refer to standardized interventions such as scripted discussion, pamphlets or videos. Educational interventions should begin with an assessment of the person's knowledge of the injury and their health goals. The content of the structured education interventions may include (but is not limited to): reassurance about the favourable prognosis of NAD I-II; advice on return to usual activities, including work; instruction of exercise; discussion of expected pain and pain mechanism; discussion of prognosis; pain coping skills; discussion of workplace ergonomics; and self-care strategies or general health.

Table 4.C: Structured patient education for recent onset NAD I-II

Recommendation 4.1.3.1.1	Provide information about the nature, management, and course of NAD as a framework for the initiation of the program of care.
4.1.3.1.2	Consider a structured patient education program as an adjunct to an effective program of care based on individual patient presentation.*
4.1.3.1.3	Do not offer structured patient education alone, in either verbal or written formats.
References: • Decision Determinants and Evidence Table for NAD – Report 1 – Appendix 2	

* The structured education program should focus on providing advice to stay active and reassuring the patient by addressing the expectation of recovery.

SECTION 4.1.3.2

▸ EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common to the treatment and rehabilitation of neck pain.

Table 4.D: Exercise for recent onset NAD I-II

Recommendation 4.1.3.2.1	Consider unsupervised range of motion exercises (5 to 10 repetitions of each exercise with no resistance, up to 6 to 8 times per day).*
References: • Decision Determinants and Evidence Table for NAD – Report 2 – Appendix 2	

* Daily home unsupervised, gentle and controlled range of motion of exercise of the neck and shoulder joints, including neck retraction, extension, flexion, rotation, lateral bending motions, and scapular retraction. The exercise program should be instructed by a health care professional.

SECTION 4.1.3.3

▸ MULTIMODAL CARE

Multimodal care includes at least two distinct therapeutic modalities, provided by one or more health care disciplines.

Table 4.E: Multimodal care for recent onset NAD I-II

Recommendation 4.1.3.3.1	Consider a maximum of 6 sessions over 8 weeks of multimodal care that includes exercise* and manual therapy.**
References: • Decision Determinants and Evidence Table for NAD – Report 3 – Appendix 2	

* Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common for the treatment and rehabilitation of neck pain. Exercise interventions could include any prescribed movements with the intent of affecting clinical outcomes with respect to neck pain.

** Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation and mobilization. Manipulation is a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion. Mobilization refers to a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion. For the purpose of this recommendation, manual therapy refers to manipulation or mobilization to the cervical and/or the thoracic spine as clinically indicated.

SECTION 4.1.3.4

▸ SOFT TISSUE THERAPY

Soft tissue therapy is a mechanical therapy in which muscles, tendons, and ligaments are passively pressed or kneaded by hand or with mechanical devices. It includes relaxation massage, clinical massage, movement re-education and energy work.

Table 4.F: Soft tissue therapy for recent onset NAD I-II

Recommendation 4.1.3.4.1	Do not offer strain-counterstrain.*
4.1.3.4.2	Do not offer relaxation massage.**
References: • Decision Determinants and Evidence Table for NAD – Report 4 – Appendix 2	

* Strain-counterstrain is a soft tissue therapy (clinical massage and movement re-education technique) that involves applied pressure to a muscle with positioning of the neck to provide a small stretch to a muscle.
** Relaxation massage refers to a group of soft tissue therapies intended to relax muscles. Examples of relaxation massage techniques are effleurage, petrissage, and tapotement.

SECTION 4.1.3.5

▸ PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 4.G: Passive physical modalities for recent onset NAD I-II

Recommendation 4.1.3.5.1	Do not offer a cervical collar.
4.1.3.5.2	Do not offer moist heat as an intervention in the clinic.
4.1.3.5.3	Do not offer electrical muscle stimulation.*
References: • Decision Determinants and Evidence Table for NAD – Report 5 – Appendix 2	

* Electrical muscle stimulation transmits electrical impulses to muscles via electrodes placed superficially on the skin.

SECTION 4.1.3.6

▸ ACUPUNCTURE

Acupuncture is a therapeutic technique that utilizes a thin metal needle to puncture the skin and stimulate specific points. Various acupuncture techniques exist, as well as the use of other types of stimulation in combination with or instead of a needle. Acupuncture interventions include body needling, moxibustion, electroacupuncture, laser acupuncture, microsystem acupuncture and acupressure.

Table 4.H: Acupuncture for recent onset NAD I-II

Recommendation 4.1.3.6.1	Do not offer electroacupuncture.*
References: • Decision Determinants and Evidence Table for NAD – Report 6 – Appendix 2	

* Electroacupuncture refers to the electrical stimulation of acupuncture points with acupuncture needles or electrotherapy applied to the skin.

SECTION 4.1.3.7

▸ MEDICATION

Our reviews investigated the effectiveness of three classes of medication: analgesics, non-steroidal anti-inflammatory drugs (NSAIDs), and muscle relaxant. Analgesics are drugs that are used to reduce or relieve pain without blocking the conduction of nerve impulses, significantly altering sensory perception or producing a loss of consciousness. An example of a non-opioid analgesic drug is acetaminophen. NSAIDs are medications that block the action of cyclooxygenase (Cox)-1 and/or Cox-2 to help reduce inflammation. Muscle relaxants are a broad range of drugs with different chemical structures and mechanisms of action, which fall into three groups according to their actions along the voluntary motor control: muscle decoupler, neuromuscular blockers, and spasmolytics.

Table 4.I: Medication for recent onset NAD I-II

Recommendation 4.1.3.7.1	Consider muscle relaxants*
References: • Decision Determinants and Evidence Table for the Systematic Review on Muscle Relaxants for Neck Pain and Associated Disorders – Report 11 – Appendix 2 • Decision Determinants and Evidence Table for the Systematic Review of Non-opioid Analgesic Drugs for Neck and Associated Disorders – Report 9 - Appendix 2 • Decision Determinants and Evidence Table for the Systematic Review of Non-steroidal Anti-inflammatory Drugs for Neck and Associated Disorders – Report 10 - Appendix 2	

* The evidence indicates that analgesia is the primary therapeutic benefit, prolongation of usage is not warranted. There is no evidence of differential efficacy for the various drugs within each class. There is also no evidence that any combination of these medications provides added benefit. There are potentially significant adverse effects associated with use of these classes of medications. Finally, the non-opioid first 'step' in the Analgesic Ladder includes NSAIDs, muscle relaxant and acetaminophen (Vargas-Schaffer G. Is the WHO analgesic ladder still valid? Twenty-four years of experience. Vol 56: June 2010 Canadian Family Physician). However, the evidence does not indicate that acetaminophen is an effective analgesic for either NAD or low back pain; therefore, the use of acetaminophen is not recommended.

SECTION 4.1.4

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT NAD I-II

This section summarizes the key recommendations for the management of NAD I-II for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movements.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 4.1.4.1

STRUCTURED PATIENT EDUCATION

Structured patient education aims to enable individuals to make informed decisions about their personal health-related behaviour. Structured education strategies refer to standardized interventions such as scripted discussion, pamphlets, or videos. Educational interventions should begin with an assessment of the person's knowledge of the injury and their health goals. The content of the structured education interventions may include (but is not limited to): reassurance about the favourable prognosis of NAD I-II; advice on return to usual activities, including work; instruction of exercise; discussion of expected pain and pain mechanism; discussion of prognosis; stress-coping skills; discussion of workplace ergonomics; and self-care strategies or general health.

Table 4.J: Structured patient education for persistent NAD I-II

Recommendation 4.1.4.1.1	Provide information about the nature, management, and course of NAD as a framework for the initiation of the program of care.
4.1.4.1.2	Consider a structured patient education program as an adjunct to an effective program of care based on individual patient presentation.*
References: • Decision Determinants and Evidence Table for NAD – Report 1 – Appendix 2	

* The structured education program should focus on providing advice to stay active and reassuring the patient by addressing the expectation of recovery.

SECTION 4.1.4.2

▸ EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common for the treatment and rehabilitation of neck pain.

Table 4.K: Exercise for persistent NAD I-II

Recommendation 4.1.4.2.1	Offer a program of supervised combined exercise* (strengthening, range of motion, and flexibility exercises). The program should be limited to a maximum of 2 sessions/week for 12 weeks.
4.1.4.2.2	Offer a program of qigong** exercises supervised by a certified qigong instructor. The program should be limited to a maximum of 2 sessions/week for 12 weeks.
4.1.4.2.3	Offer a program of Iyengar yoga*** supervised by a certified Iyengar yoga teacher. The program should be limited to a maximum of 9 sessions over 9 weeks.
4.1.4.2.4	Do not offer programs consisting solely of clinic-based supervised high dose strengthening exercises.****
References: • Decision Determinants and Evidence Table for NAD – Report 2 – Appendix 2	

* Supervised combined exercise refers to a supervised and standardized group of exercise developed to improve persistent neck pain and consists of active cervical rotation, strengthening and flexibility exercises.
** Qigong refers to gentle, focused exercises for mind and body to increase and restore the flow of qi energy and encourage healing.
*** Iyengar yoga refers to a range of classical yoga poses adapted with the use of modified poses or supportive props for individuals with specific health issues.
**** Clinic-based supervised high dose strengthening exercises refers to a high frequency of supervised in-clinic sessions over a short time period, incorporating neck and upper body dynamic resistance strengthening.

SECTION 4.1.4.3

▸ MULTIMODAL CARE

Multimodal care includes at least two distinct therapeutic modalities, provided by one or more health care disciplines.

Table 4.L: Multimodal care for persistent NAD I-II

Recommendation 4.1.4.3.1	Consider a maximum of 6 sessions over 8 weeks of multimodal care that includes exercise* and manual therapy.** Multimodal care for persistent Grade I-II NAD should only be considered if not previously given in the first three months of care. However, a second course could be indicated if the patient demonstrates ongoing and significant improvement.
References: • Decision Determinants and Evidence Table for NAD – Report 3 – Appendix 2	

* Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common for the treatment and rehabilitation of neck pain. Exercise interventions could include any prescribed movements with the intent of affecting clinical outcomes with respect to neck pain.
** Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation and mobilization. Manipulation is a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion. Mobilization refers to a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion. For the purpose of this recommendation, manual therapy refers to manipulation or mobilization to the cervical and/or the thoracic spine as clinically indicated.

SECTION 4.1.4.4

SOFT TISSUE THERAPY

Soft tissue therapy is a mechanical therapy in which muscles, tendons, and ligaments are passively pressed or kneaded by hand or with mechanical devices. It includes relaxation massage, clinical massage, movement re-education and energy work.

Table 4.M: Soft tissue therapy for persistent NAD I-II

Recommendation 4.1.4.4.1	Consider up to 10 sessions over 10 weeks of clinical massage. This treatment is expected to provide short-term benefits only.*
4.1.4.4.2	Do not offer strain-counterstrain.**
4.1.4.4.3	Do not offer relaxation massage.***
References: • Decision Determinants and Evidence Table for NAD – Report 4 – Appendix 2	

* Clinical massage refers to a group of soft tissue therapies that targets muscles with specific goals such as relieving pain, releasing muscle spasms or improving restricted motion. An example of clinical massage is myofascial trigger point therapy.
** Strain-counterstrain is a soft tissue therapy (clinical massage and movement re-education) that involves applied pressure to a muscle with positioning of the neck to provide a small stretch a muscle.
*** Relaxation massage refers to a group of soft tissue therapies intended to relax muscles. Examples of relaxation massage techniques are effleurage, petrissage, and tapotement.

SECTION 4.1.4.5

▸ PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 4.N: Passive physical modalities for persistent NAD I-II

Recommendation 4.1.4.5.1	Consider up to 12 sessions over 4 weeks of clinic-based low level laser therapy (LLLT)* (continuous or pulsed application; wavelength = 830 or 904 nm).
4.1.4.5.2	Do not offer transcutaneous electrical nerve stimulation (TENS).**
4.1.4.5.3	Do not offer pulsed short-wave diathermy.***
4.1.4.5.4	Do not offer moist heat as an intervention in the clinic.
4.1.4.5.5	Do not offer electrical muscular stimulation.****
References: • Decision Determinants and Evidence Table for NAD – Report 5 – Appendix 2	

* Low-level laser therapy is the application of a coherent light beam (laser) to a region for the purpose of reducing local pain or promoting local healing.
** TENS is a passive physical modality connected to the skin, using two or more electrodes to apply low-level electrical current. It is typically used with the intent to help pain management.
*** Pulsed short-wave diathermy uses electromagnetic energy to heat underlying tissues with the intent to help inflammatory and repair phases in soft tissues.
**** Electrical muscle stimulation transmits electrical impulses to muscles via electrodes placed superficially on the skin.

SECTION 4.1.4.6

▸ PSYCHOLOGICAL INTERVENTION

A psychological intervention is a method used to treat psychological distress, consequences of musculoskeletal injuries (such as pain), or psychological disorders; primarily (but not exclusively) by verbal or non-verbal communication. Psychological interventions can be broadly subdivided into several theoretical orientations, including but not limited to psychodynamic, psychoanalytic, behavioural/cognitive behavioural, humanistic and existential, family/systems approaches and combinations of these approaches. Psychological interventions can include (but are not limited to) in-person psycho-education; booklet/written material that includes a psycho-educational component; cognitive-behavioural interventions, or a guided psychological self-help intervention.

Table 4.O: Psychological interventions for persistent NAD I-II

Recommendation 4.1.4.6.1	Do not offer a standalone course of relaxation training for pain intensity or disability outcomes.
References: • Decision Determinants and Evidence Table for NAD – Report 7 – Appendix 2	

SECTION 4.1.4.7

ACUPUNCTURE

Acupuncture is a therapeutic technique that utilizes a thin metal needle to puncture the skin and stimulate specific points. Various acupuncture techniques exist, as well as the use of other types of stimulation in combination with or instead of a needle. Acupuncture interventions include body needling, moxibustion, electroacupuncture, laser acupuncture, microsystem acupuncture and acupressure.

Table 4.P: Acupuncture for persistent NAD I-II

Recommendation 4.1.4.7.1	Do not offer electroacupuncture.*
References: • Decision Determinants and Evidence Table for NAD – Report 6 – Appendix 2	

* Electroacupuncture refers to the electrical stimulation of acupuncture points with acupuncture needles or electrotherapy applied to the skin.

SECTION 4.1.4.8

MEDICATION

Our reviews investigated the effectiveness of three classes of medication: analgesics, non-steroidal anti-inflammatory drugs (NSAIDs), and muscle relaxant. Analgesics are drugs that are used to reduce or relieve pain without blocking the conduction of nerve impulses, significantly altering sensory perception or producing a loss of consciousness. An example of a non-opioid analgesic drug is acetaminophen. NSAIDs are medications that block the action of cyclooxygenase (Cox)-1 and/or Cox-2 to help reduce inflammation. Muscle relaxants are a broad range of drugs with different chemical structures and mechanisms of action, which fall into three groups according to their actions along the voluntary motor control: muscle decoupler, neuromuscular blockers, and spasmolytics.

Table 4.Q: Medication for persistent NAD I-II

Recommendation 4.1.4.8.1	Consider non-steroidal anti-inflammatory drugs (NSAIDs)*
4.1.4.8.2	Do not offer botulinum toxin injections

References:

- Decision Determinants and Evidence Table for the Systematic Review on Muscle Relaxants for Neck Pain and Associated Disorders – Report 11 – Appendix 2
- Decision Determinants and Evidence Table for the Systematic Review of Non-opioid Analgesic Drugs for Neck and Associated Disorders – Report 9 - Appendix 2
- Decision Determinants and Evidence Table for the Systematic Review of Non-steroidal Anti-inflammatory Drugs for Neck and Associated Disorders – Report 10 - Appendix 2

* The evidence indicates that analgesia is the primary therapeutic benefit of the muscle relaxant and NSAID classes of medication. Pain reduction should be apparent during the initial period of usage; in the absence of therapeutic benefit, prolongation of usage is not warranted. There is no evidence of differential efficacy for the various drugs within each class. There is also no evidence that any combination of these medications provides added benefit. There are potentially significant adverse effects associated with use of these classes of medications. Finally, the non-opioid first 'step' in the Analgesic Ladder includes NSAIDs, muscle relaxant and acetaminophen (Vargas-Schaffer G. Is the WHO analgesic ladder still valid? Twenty-four years of experience. Vol 56: June 2010 Canadian Family Physician). However, the evidence does not indicate that acetaminophen is an effective analgesic for either NAD or low back pain; therefore, the use of acetaminophen is not recommended.

Quick Reference Guide – Management of NAD Grade III

Symptoms ≤ 3 months post-collision	Symptoms > 3 months post-collision
For all injured persons with NAD III: **Rule out** risk factors for serious pathologies[a] **Assess** for factors delaying recovery: prior history of collision-related NAD, older age, high levels of initial pain, post-crash psychological factors [poor recovery expectation, depressed mood, anxiety or fear about pain, kinesiophobia, acute stress disorder (symptoms ≤ 4 weeks from injury), post-traumatic stress disorder (symptoms > 4 weeks), high levels of frustration or anger about pain, passive coping] **Offer** information on nature, management, course of NAD as a framework for initiation of a program of care **Conduct** ongoing assessment for symptom improvement or worsening/progress during intervention period and refer accordingly **Reassess and Monitor** the presence of acute stress disorder, post-traumatic stress disorder, kinesiophobia, passive coping, depression, anxiety, anger, frustration and fear **Discharge** injured person as appropriate at any point during intervention and recovery	
Based upon shared decision making between the patient and provider, the following therapeutic interventions are recommended:[b,c] 1) Structured education, reassurance 2) Supervised graded neck strengthening exercise **Refer to specific recommendation for treatment details (Section 4.2.3)**	**Refer to medical physician for consideration of further investigation of the neurological deficits**[b,c] * No admissible evidence of effective management of persistent NAD III
Do Not Offer:[d] • Cervical collar • Structured patient education alone, in either verbal or written formats • Low level laser therapy • Intermittent traction	**Do Not Offer:**[d] • Cervical collar
Outcome: **Recovered →** Discharge **Improvement (neurological signs no longer present) →** Refer to NAD I/II care pathway **Incomplete recovery →** Refer to physician **Major symptom change or development of serious pathology (new or worsening physical, mental or psychological symptoms) →** Refer to physician	

[a] Risk factors for serious pathologies (also known as red flags): Cancer (history of cancer, unexplained weight loss, nocturnal pain, age >50), vertebral infection (fever, intravenous drug use, recent infection), osteoporotic fractures (history of osteoporosis, use of corticosteroid, older age), traumatic fracture (positive Canadian C-Spine rule), myelopathy – severe/progressive neurological deficits (painful stiff neck, arm pain and weakness, sensory changes in lower extremity, motor weakness and atrophy, hyper-reflexia, spastic gait), carotid/vertebral artery dissection (sudden and intense onset of headache or neck pain), brain haemorrhage/mass lesion (sudden and intense onset of headache), inflammatory arthritis (morning stiffness, swelling in multiple joints)
[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness
[c] The ordering of interventions does not reflect superiority of effectiveness
[d] Based on evidence of no benefit to patients

The care pathway is presented in Figure 4.3.

At initial contact, health care professionals should educate and reassure the patient that neck and arm pain will resolve within a few months of symptom onset. Patients greatly improve their recovery by actively engaging in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first 3 months of care for NAD III is described below.

Assess the Patient and Classify NAD

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. Cervical spine fractures and dislocations can be ruled out using the Canadian C-spine rule (Appendix 4.A). The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional.* However, once pathology has been ruled out, the patient should be treated according to the NAD care pathway.

Assess neurological signs (decreased deep tendon reflexes, muscle weakness or sensory deficits).

Classify the grade of NAD as grade III (Table 4.A).

Patients without neurological signs should be managed under the “Care Pathway for the Management of NAD I-II” (see section 4.1).

Assess the Prognostic Factors

Assess the prognostic factors for delayed recovery. Most patients recover from their injury. Patients with Grade I NAD are expected to recover the most quickly, while those with NAD III are expected to recover the slowest. However, patients with the following prognostic factors may have a higher risk for delayed recovery:

- Prior history of NAD related to a motor vehicle collision
- Older age
- High levels of initial pain
- Post-collision psychological factors:
    - Poor expectation of recovery
    - Depressed mood, feelings of depression about the pain
    - Anxiety or fear about pain, kinesiophobia or avoiding activities due to fear of pain
    - Symptoms of acute stress disorder (symptoms exhibited within 4 weeks of the injury)/post-traumatic stress disorder (symptoms lasting at least one month)
    - High levels of frustration or anger about the pain
    - Passive coping

Examples of questions or tools recommended to assess the prognostic factors for delayed recovery are available in Appendix 4.B.

Educate and Reassure the Patient

Develop a patient-centred care plan in partnership with the patient.

Health care professionals need to reassure patients that there are no major structural or progressive pathologies (NAD IV) in their neck.

Prognostic factors for poor recovery should be addressed when present. The care should start with education and reassurance about the benign and self-limited nature of NAD III and the importance of maintaining activity and movement. This is particularly important when the patient reports poor expectation of recovery.

It is also important to reassure patients that it is normal to feel some anxiety, distress or anger following a traffic collision. In the presence of such symptoms or emotions, the health care professional should listen to the patient's concerns, discuss them and adjust the care plan accordingly.

Deliver the Clinical Care

The goal of the care plan is to promote activity through exercise and clinical interventions that promote resolution of symptoms and restoration of function. Based upon shared decision making between the patient and provider, the following therapeutic interventions are recommended:

- Structured education (advice to stay active) reassurance, and
- Supervised graded neck strengthening exercises supplemented by home exercises and acetaminophen or a non-steroidal anti-inflammatory drug. It is important that the health care professional encourages the patient to participate in their care by stretching their neck at home on a daily basis.

Interventions that are not recommended include:

- Cervical collar
- Structured patient education alone (either verbal or written)
- Low level laser therapy
- Intermittent traction

Discuss the risks and benefits of the care plan with the patient.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered. Patients who have not recovered should follow the care pathway outlined in the guideline.*

* The use of a valid and reliable condition-specific instrument (e.g., Neck Disability Index) is encouraged but should not be used to measure overall recovery.

4.2.1 CARE PATHWAY FOR RECENT ONSET NAD III (0-3 MONTHS POST-COLLISION)

Patients who improve and no longer report arm pain but still experience neck pain should be managed according to the care pathway for the management of NAD I-II (section 4.1)

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to a physician for further evaluation at any time point during their care.

Patients who still suffer from neurological signs after the first 3 months of care should be referred to a physician for further evaluation.

Table 4.B Risk factors of serious pathology (red flags) for neck pain

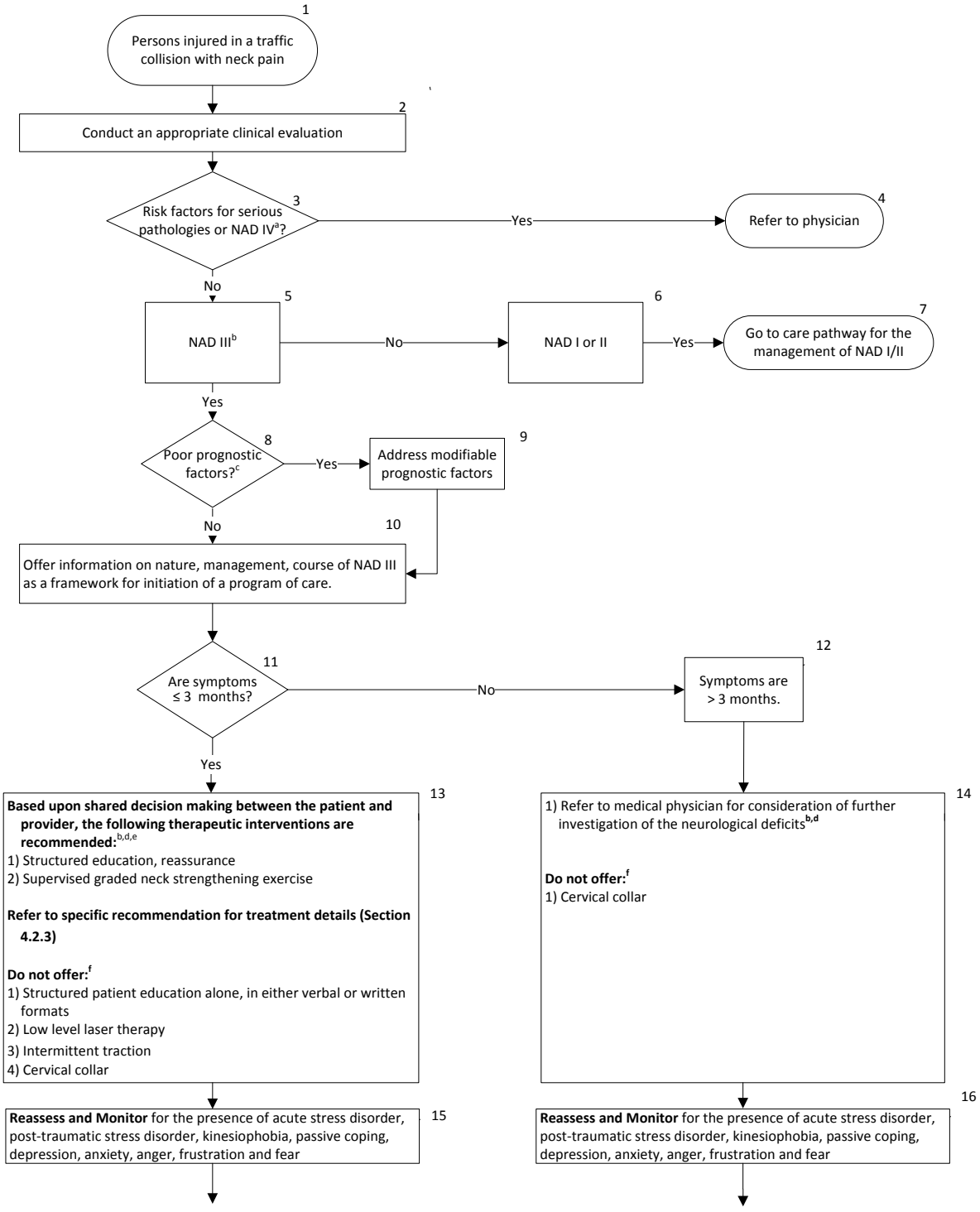
Possible cause	Risk factors of serious pathology identified during history or physical examination*
Fracture/dislocation	• Positive Canadian C-spine rule
Cancer	• History of cancer • Unexplained weight loss • Nocturnal pain • Age > 50
Vertebral infection	• Fever • Intravenous drug use • Recent infection
Osteoporotic fractures	• History of osteoporosis • Use of corticosteroid • Older age
Myelopathy - Severe/progressive neurological deficits	• Painful stiff neck • Arm pain and weakness • Sensory changes in lower extremity • Motor weakness and atrophy • Hyper-reflexia • Spastic gait
Carotid/vertebral artery dissection	• Sudden and intense onset of headache or neck pain
Brain haemorrhage/mass lesion	• Sudden and intense onset of headache
Inflammatory arthritis	• Morning stiffness • Swelling in multiple joints

* This list of risk factors of serious pathology was informed from the following peer reviewed articles rather than being developed from a systematic review of the literature on “red flags”:
Chou R, Qaseem A, Snow S, Casey D, Cross JT, Shekelle P, Owens DK for the Clinical Efficacy Assessment Subcommittee of the American College of Physicians and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel. Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147: 478-491.
Downie A, Williams CM, Henschke N, Hancock MJ, Ostelo RWJG, de Vet HC, Macaskill P, Irwig L, van Tulder MW, Koes BW, Maher CG. Red flags to screen for malignancy and fracture in patients with low back pain: systematic review. BMJ 2013;347:f7095 doi: 10.1136/bmj.f7095); 75.
Nordin M, Carragee, EJ, Hogg-Johnson S, Schecter Weiner S, Hurwitz EL, Peloso PM, Guzman J, van der Velde G, Carroll LJ, Holm LW, Côté P, Cassidy JD, Haldeman S. Assessment of neck pain and its associated disorders. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and its Associated Disorders. Spine. 2008; 33 (4S): S101-S122.

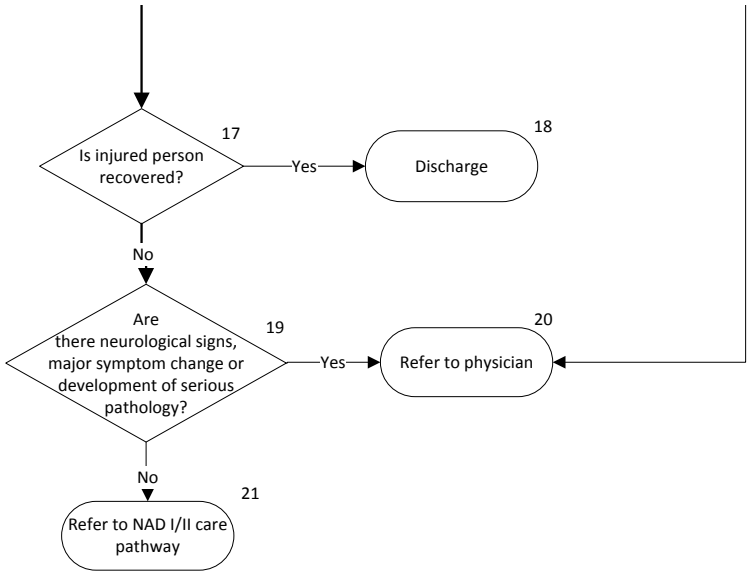
The care pathway is presented in Figure 4.3.

Patients who still experience neurological signs and disability more than 3 months after the injury should be referred to a physician for further investigation of neurological deficits.

Figure 4.3: Care Pathway for the Management of NAD Grade III



4.2.2 CARE PATHWAY FOR PERSISTENT NAD III (4-6 MONTHS POST-COLLISION)



[a] Risk factors for serious pathologies (also known as red flags): Cancer (history of cancer, unexplained weight loss, nocturnal pain, age >50), vertebral infection (fever, intravenous drug use, recent infection), osteoporotic fractures (history of osteoporosis, use of corticosteroid, older age), traumatic fracture (positive Canadian C-Spine rule), myelopathy – severe/progressive neurological deficits (painful stiff neck, arm pain and weakness, sensory changes in lower extremity, motor weakness and atrophy, hyper-reflexia, spastic gait), carotid/vertebral artery dissection (sudden and intense onset of headache or neck pain), brain haemorrhage/mass lesion (sudden and intense onset of headache), inflammatory arthritis (morning stiffness, swelling in multiple joints)

[b] Conduct ongoing assessment for Improvement or worsening/progress of symptoms during intervention and refer accordingly.

[c] Assess for factors delaying recovery: prior history of collision-related NAD, older age, high levels of initial pain, post-crash psychological factors [poor recovery expectation, depressed mood, anxiety or fear about pain, kinesiophobia, acute stress disorder (symptoms ≤ 4 weeks from injury), post-traumatic stress disorder (symptoms > 4 weeks), high levels of frustration or anger about pain, passive coping]

[d] This guideline does not include interventions for which there is a lack of evidence of effectiveness.

[e] The ordering of interventions does not reflect superiority of effectiveness

[f] Based on evidence of no benefit to patients

SECTION 4.2.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT ONSET NAD III

This section summarizes the key recommendations for the management of NAD III for the first 3 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with “offer” indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording “consider” indicates that an intervention is as effective as another one. The wording “do not offer” indicates, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limiting nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement. Emphasize active rather than passive treatments.
- Deliver a time-limited program of care.
- Do not provide ineffective or experimental treatments.

SECTION 4.2.3.1

STRUCTURED PATIENT EDUCATION

Structured patient education aims to enable individuals to make informed decisions about their personal health-related behaviour. Structured education strategies refer to standardized interventions such as scripted discussion, pamphlets or videos. Educational interventions should begin with an assessment of the person's knowledge of the injury and their health goals. The content of the structured education interventions may include (but is not limited to): reassurance about the favourable prognosis of most NAD III; advice on return to usual activities, including work; instruction of exercise; discussion of expected pain and pain mechanism; discussion of prognosis; stress-coping skills; discussion of workplace ergonomics; and self-care strategies or general health.

Table 4.R: Structured patient education for recent onset NAD III

Recommendation 4.2.3.1.1	Provide information about the nature, management, and course of NAD as a framework for the initiation of the program of care.
4.2.3.1.2	Consider a structured patient education program as an adjunct to an effective program of care based on individual patient presentation.*
4.2.3.1.3	Do not offer structured patient education alone; either in verbal or written formats.
References: • Decision Determinants and Evidence Table for NAD – Report 1 – Appendix 2	

* The structured education program should focus on providing advice to stay active and reassuring the patient by addressing the expectation of recovery.

SECTION 4.2.3.2

▸ EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common for the treatment and rehabilitation of neck pain.

Table 4.S: Exercise for recent onset NAD III

Recommendation 4.2.3.2.1	Consider 2 sessions/week for six weeks of supervised graded neck strengthening exercises.*

References:

- Decision Determinants and Evidence Table for NAD – Report 2 – Appendix 2

* Graded neck strengthening exercises refers to standardized activity exercises intended to strengthen the superficial and deep neck musculature. The home exercise program includes daily range of motion, strengthening and relaxation exercises and may be supplemented by acetaminophen or a non-steroidal anti-inflammatory. Please see Appendix 4.C for a detailed description of the exercise program.

SECTION 4.2.3.3

▸ PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 4.T: Passive physical modalities for recent onset NAD III

Recommendation 4.2.3.3.1	Do not offer a cervical collar.
4.2.3.3.2	Do not offer low level laser therapy (LLLT).*

References:

- Decision Determinants and Evidence Table for NAD – Report 5 – Appendix 2

* Low level laser therapy is the application of a coherent light beam (laser) to a region for the purpose of reducing local pain or promoting local healing.

SECTION 4.2.3.4

▸ MANUAL THERAPY

Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization and traction.

Table 4.U: Manual therapy for recent onset NAD III

Recommendation 4.2.3.4.1	Do not offer traction.*
References: • Decision Determinants and Evidence Table for NAD – Report 8 – Appendix 2	

* Traction is defined as a manual or mechanically assisted application of an intermittent or continuous distractive force.

SECTION 4.2.4

▸ KEY RECOMMENDATIONS FOR THE CLINICAL MANAGEMENT OF PERSISTENT NAD III

The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Patients who still suffer from neurological deficits (decreased deep tendon reflexes, muscle weakness or sensory deficits) three months after their injury should be referred to a physician for further evaluation.

SECTION 4.2.4.1

▸ PASSIVE PHYSICAL MODALITIES

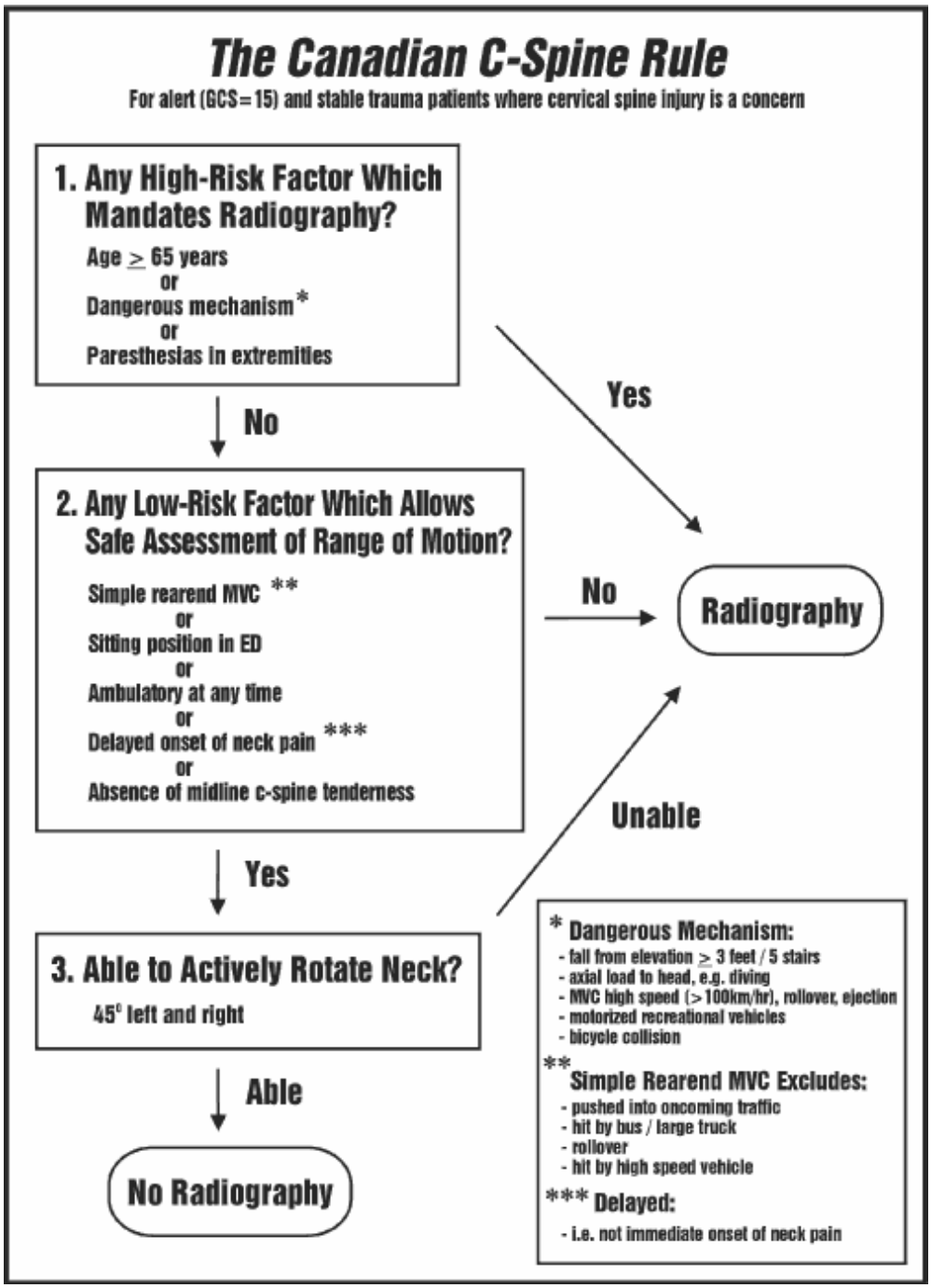
Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 4.V: Passive physical modalities for persistent NAD III

Recommendation 4.2.4.1.1	Do not offer a cervical collar.
References: • Decision Determinants and Evidence Table for NAD – Report 5 – Appendix 2	

Appendix 4.A

▸ CANADIAN C-SPINE RULE



Adopted with permission from Stiell et al. The Canadian C-Spine Rule for Radiography in Alert and Stable Trauma Patients. JAMA. 2001;286(15):1841-1848. doi:10.1001/jama.286.15.1841.

Appendix 4.B

EXAMPLE OF QUESTIONS OR TOOLS TO ASSESS PROGNOSTIC FACTORS FOR DELAYED RECOVERY

These are examples of measures that may be helpful. This is not meant to represent a comprehensive list of measures.

A.1 Poor expectation of recovery

- Do you think that your injury will…a) get better soon; b) get better slowly; c) never get better; d) don't know

A.2 Depressed mood, feelings of depression about the pain

- Patient Health Questionnaire-9 (PHQ-9)
- Center for Epidemiologic Studies Depression Scale Revised (CESD-R)
- Depression scale of the Hospital Anxiety and Depression Scale (HADS)
- Beck Depression Inventory-II

A.3 Anxiety or fear about the pain, kinesiophobia or avoidance of activities due to fear of pain

- Tampa Scale of Kinesiophobia
- Fear Avoidance of Pain Scale

A.4 Symptoms of Acute Stress Disorder (symptoms exhibited within 4 weeks of the injury)/Post-Traumatic Stress Disorder (symptoms lasting at least one month)

- Impact of Events Scale – Revised
- Trauma Screening Questionnaire

A.5 High levels of frustration or anger about the pain

- Stand-alone question such as: How frustrated (angry) do you feel about your pain (0 means no frustration/anger - 10 means as frustrated/angry as you can imagine)

A.6 Passive coping

- Passive coping scale of the Pain Management Inventory
- Pain Catastrophizing Scale

Appendix 4.C

GRADED NECK STRENGTHENING EXERCISES

Graded neck strengthening exercises were prescribed as follows:*

Supervised hands-off exercise therapy:

Exercise 1: Chest press, sitting position

- Purpose: warming-up
- 2 x 10 repetitions with 5 kg.

Exercise 2: Lateral pull-down, sitting position

- Purpose: warming-up
- 2 x 10 repetitions with 20 kg

Exercise 3: Low-back flies

- Purpose: warming-up
- Dumbbells in both hands and make 'flying movements', bent forward standing position or in roman chair
- 2 x 10 repetitions with 1 kg

Exercise 4: Neck-press

- Purpose: stability
- Push dumbbells from the shoulder above the head, standing position
- 2 x 10 repetitions with 1 kg

Exercise 5: Front-raises

- Purpose: stability
- Elevate dumbbells forward to shoulder height, standing position
- 2 x 10 repetitions with 1 kg

Exercise 6: Upright row

- Purpose: strength
- 'Rowing up' bar with weights; elbows finish above shoulder height and wrists finish at shoulder height, standing position
- 2 x 10 repetitions with 7.5 kg

Exercise 7: Weight rotation

- Purpose: strength and stability
- In standing position, keep bar with weights on top in vertical position, bottom part stays on the ground, with stretched arms and rotate to left and right
- 3 repetitions: 5 x to left, 5 x to right with 7.5 kg

* Kuijper B, Tans JT, Beelen A, Nollet F, de Visser M. Cervical collar or physiotherapy versus wait and see policy for recent onset cervical radiculopathy: randomised trial. BMJ 2009;339:b3883

Home exercises prescribed in addition to supervised exercises:
Once a day 2x10 repetitions.

Exercise 1. Purpose: mobility

- Standing position. In neutral position: withdraw chin.

Exercise 2. Purpose: mobility

- Lying on the back. Withdraw chin while keeping head on the ground.

Exercise 3. Purpose: mobility

- Standing position. Withdraw chin and turn head to one side as far as possible. Repeat in the opposite direction.

Exercise 4. Purpose: stability and muscle strength

- Standing position. Withdraw chin, place the palm of the hand against the head (left or right side of the forehead), and give resistance against the hand with the head (do not allow any movements of the head).

Exercise 5. Purpose: stability and muscle strength

- Standing position. Place right hand against the head behind the right ear, left hand on the left side of the forehead. Rotate the head to the right against the resistance of the hands. Reverse hand positions and repeat to the left. No movements of the head.

Exercise 6. Purpose: stability and muscle strength

- Standing position. Withdraw chin, place both hands on the back of the head, and push the head against the hands. No movement of the head allowed.

Exercise 7. Purpose: stability and muscle strength

- Standing position. Withdraw chin, place the right hand on the right side of the head and move the head to the right against resistance. Repeat to the left.

Exercise 8. Purpose: stability and muscle strength

- Lying on the back. Lift the head a little from the ground and move the chin just a little bit towards the chest.

Exercise 9. Purpose: stability and muscle strength

- Lying on the back, lift the head a little from the ground and turn the head to the right. Repeat to the left.

Exercise 10. Purpose: relaxation.

- Sitting on a chair. Keep both arms down. Pull back the shoulders and relax again.

SECTION 5.0

GUIDELINE FOR THE CLINICAL MANAGEMENT OF PERSISTENT HEADACHES ASSOCIATED WITH NECK PAIN

This evidence-based guideline establishes the best practice for the clinical management of persistent headaches that are associated with neck pain caused or exacerbated by a motor vehicle collision. Specifically, the guideline covers management of headaches associated with neck pain that persist for more than 3 months post-collision. These headaches include persistent tension-type (episodic and chronic) and cervicogenic headaches.

Recent onset headaches (0-3 months post-collision) that are associated with neck pain should be managed under the Care Pathway for the Management of Recent Onset NAD I-II (Chapter 4).

This guideline does not cover the management of headaches that persist for more than 6 months post-collision. Moreover, it does not cover the management of headaches associated with mild traumatic brain injury. The recommendations for the management of mild traumatic brain injury are presented in Chapter 9. This guideline is not indicated for headaches that are associated with major structural or other pathological causes.

In 2008, the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders stated that headaches are commonly associated with neck pain and can originate from the neck. In Canada, individuals with neck pain are up to 10 times* more likely to suffer from headaches than those without neck pain. Moreover, more than 80%† of individuals who experience headaches after a motor vehicle collision also experience neck pain.

In this guideline, the diagnosis of tension-type and cervicogenic headaches follows the International Classification of Headache Disorders, 2nd edition‡ (Appendix 5.A).

The clinical management recommended in this guideline aims to: 1) accelerate recovery; 2) reduce the intensity of symptoms; 3) promote early restoration of function; 4) prevent chronic pain and disability; 5) improve health-related quality of life; 6) reduce recurrences; and 7) promote active participation of patients in their care.

* Côté P, Cassidy JD, Carroll L. The factors associated with neck pain and its related disability in the Saskatchewan population. Spine (Phila Pa 1976) 2000;25(9):1109-17.
† Cassidy JD, Carroll LJ, Côté P, Lemstra M, Berglund A, Nygren A. Effect of eliminating compensation for pain and suffering on the outcome of insurance claims for whiplash injury. N Engl J Med 2000;342(16):1179-86.
‡ Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders: 2nd edition. Cephalagia 2004; 24 Suppl 1:9-160.

5.0 GUIDELINE FOR THE CLINICAL MANAGEMENT OF PERSISTENT HEADACHES ASSOCIATED WITH NECK PAIN

Patients with multiple injuries should be managed using all appropriate care pathways. For example, a patient who suffers from cervicogenic headaches and low back pain should be managed according to the recommendations included in both the cervicogenic headache and low back pain care pathways.

Patient-centered care is an internationally recognized principle that was fundamental to the development of this guideline. This guideline reinforces the importance of communication and partnership between patients and health care professionals.

All recommendations included in this guideline are based on studies with low risk of bias.

Interventions not described in this guideline are not recommended for the management of patients with headaches associated with neck pain because of a lack of evidence about their effectiveness and safety.

Health care professionals eligible to provide care under this guideline are those defined by the Statutory Accident Benefits Schedules (SABS).

All recommendations presented in this guideline integrate the:

- Key decision determinants based upon the framework developed by the Ontario Health Technology Advisory Committee (OHTAC);
- Best evidence obtained from a critical review of current scientific literature; and
- Qualitative research exploring the experiences of persons treated for traffic injuries in Ontario

All background documents and references are available at http://www.fsco.gov.on.ca

SECTION 5.1

MANAGEMENT OF RECENT ONSET HEADACHES ASSOCIATED WITH NECK PAIN

Headaches are commonly associated with a new episode of neck pain. These headaches (0-3 months post-collision) should be managed under the Care Pathway for the Management of Recent Onset NAD I-II (Chapter 4).

SECTION 5.2

MANAGEMENT OF PERSISTENT HEADACHES ASSOCIATED WITH NECK PAIN

The care pathway for the management of headaches is presented in Figure 5.1

Assess the Patient and Classify Headache

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. The presence of any risk factors for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional (Table 5.A). However, once pathology has been ruled out, the patient should be treated according to the appropriate care pathway for the management of headaches associated with neck pain.

Table 5.A Risk factors of serious pathology (red flags) for headaches associated with neck pain

Risk factors of serious pathology identified during history or physical examination*
• Worsening headache with fever • Sudden-onset headache (thunderclap) reaching maximum intensity within 5 minutes • New-onset neurological deficit • New-onset cognitive dysfunction • Change in personality • Impaired level of consciousness • Recent (typically within the past 3 months) head trauma • Headache triggered by cough, valsalva maneuver (trying to breathe out with nose and mouth blocked), or sneeze • Headache triggered by exercise • Headache that changes with posture • Symptoms suggestive of giant cell arteritis • Symptoms and signs of acute narrow-angle glaucoma • A substantial change in the characteristics of a patient's headache • New onset or change in headache in patients who are over 50 years old • Headache waking the patient up (migraine is the most frequent cause of morning headache) • Patients with risk factors for cerebral venous sinus thrombosis • Jaw claudication or visual disturbance • Neck stiffness • New onset headache in patients with a history of human immunodeficiency virus (HIV) infection • New onset headache in patients with a history of cancer

* This list of risk factors of serious pathology was informed by the following two clinical practice guidelines: Headaches: Diagnosis and management of headaches in young people and adults. Issued: September 2012. NICE clinical guideline 150. guidance.nice.org.uk/cg150. Diagnosis and management of headache in adults: A national clinical guideline. November 2008. www.sign.ac.uk.

Figure 5.1: Care Pathway for the Management of Headaches

[a] Risk factors for serious pathologies (also known as red flags): worsening headache with fever; sudden-onset headache (thunderclap) reaching maximum intensity within 5 minutes; new-onset neurological deficit; new-onset cognitive dysfunction; change in personality; impaired level of consciousness; recent (typically within the past 3 months) head trauma; headache triggered by cough, valsalva maneuver (trying to breathe out with nose and mouth blocked) or sneeze; headache triggered by exercise; headache that changes with posture; symptoms suggestive of giant cell arteritis; symptoms and signs of acute narrow-angle glaucoma; a substantial change in the characteristics of the patient's headache; new onset or change in headache in patients who are aged over 50; headache wakening the patient up (migraine is the most frequent cause of morning headache); patients with risk factors for cerebral venous sinus thrombosis; jaw claudication or visual disturbance; neck stiffness; new onset headache in patients with a history of human immunodeficiency virus (HIV) infection; new onset headache in patients with a history of cancer

The diagnostic criteria for tension-type (episodic and chronic) and cervicogenic headaches are described in Appendix 5.A.

Patients diagnosed with episodic tension-type headaches should be managed according to the care pathway described in section 5.2.1.

Patients diagnosed with chronic tension-type headaches should be managed according to the care pathway described in section 5.2.3.

Patients diagnosed with cervicogenic headaches should be managed according to the pathway care described in section 5.2.5.

SECTION 5.2.1

CARE PATHWAY FOR EPISODIC TENSION-TYPE HEADACHES (4-6 MONTHS POST-COLLISION)

Quick Reference Guide – Management of Episodic Tension-type Headaches

Symptoms > 3 months post-collision

For all injured persons with episodic tension-type headaches, after ruling out risk factors of serious pathologies[a]:
Offer information on nature, management, course of episodic tension-type headaches as a framework for initiation of a program of care
Conduct ongoing assessment for symptom improvement or worsening/progress during intervention and refer accordingly
Reassess and Monitor the presence of acute stress disorder, post-traumatic stress disorder, kinesiophobia, passive coping, depression, anxiety, anger, frustration and fear
Discharge injured person as appropriate at any point during intervention and recovery

Based upon shared decision making between the patient and provider, the following therapeutic intervention is recommended: [b]

Home and clinic-based interventions:
1. Low load endurance craniocervical and cervicoscapular exercises

Refer to specific recommendation for treatment details (Section 5.2.2)

Do Not Offer:[d]
- Manipulation of the cervical spine

Outcome:
Recovered → Discharge
Unrecovered/Incomplete recovery or major symptom change (new or worsening physical, mental or psychological symptoms) → Refer to physician

[a] Risk factors for serious pathologies (also known as red flags): worsening headache with fever; sudden-onset headache (thunderclap) reaching maximum intensity within 5 minutes; new-onset neurological deficit; new-onset cognitive dysfunction; change in personality; impaired level of consciousness; recent (typically within the past 3 months) head trauma; headache triggered by cough, valsalva maneuver (trying to breathe out with nose and mouth blocked) or sneeze; headache triggered by exercise; headache that changes with posture; symptoms suggestive of giant cell arteritis; symptoms and signs of acute narrow-angle glaucoma; a substantial change in the characteristics of the patient's headache; new onset or change in headache in patients who are aged over 50; headache wakening the patient up (migraine is the most frequent cause of morning headache); patients with risk factors for cerebral venous sinus thrombosis; jaw claudication or visual disturbance; neck stiffness; new onset headache in patients with a history of human immunodeficiency virus (HIV) infection; new onset headache in patients with a history of cancer

[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness
[c] The ordering of interventions does not reflect superiority of effectiveness
[d] Based on evidence of no benefit to patients

5.2.1 CARE PATHWAY FOR EPISODIC TENSION-TYPE HEADACHES (4-6 MONTHS POST-COLLISION)

The care pathway for episodic tension-type headache is presented in Figure 5.2.

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about headaches and address any misunderstandings or apprehension through education and reassurance. The health care professional needs to educate and reassure the patient about the nature and course of episodic tension-type headaches. In the presence of prognostic factors for delayed recovery, the health care professional should discuss them with the patient and adjust their care plan accordingly.

Determine if Ongoing Clinical Care is Necessary

Health care professionals should first determine if the patient requires ongoing clinical care. Patients with episodic tension-type headache may not require ongoing clinical care. Rather, patients can be managed with reassurance and education.

Deliver the Care Plan

Patients requiring clinical care should be encouraged to participate in their program of care by remaining active and doing home exercises on a regular basis. Based upon shared decision making between the patient and provider, the following therapeutic intervention is recommended:

- Clinic-based low load endurance craniocervical and cervicoscapular exercises. The exercise program should also be done at home.

Interventions that are not recommended include:

- Manipulation of the cervical spine.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

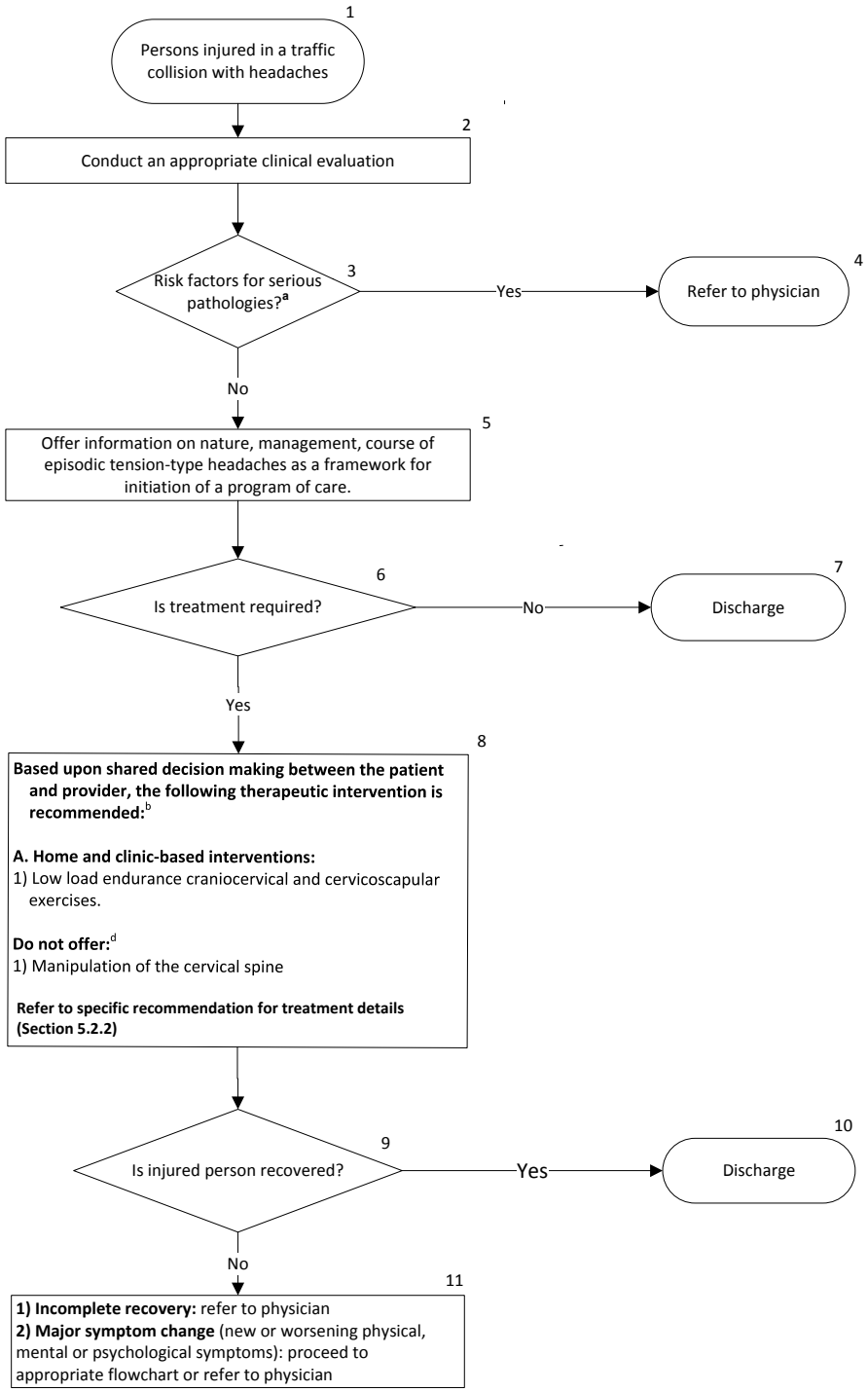
Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered. Patients who have not recovered should follow the care pathway outlined in this guideline.*

Patients with worsening symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who have not improved significantly or recovered should be referred to their physician for further evaluation.

* The use of a valid and reliable condition-specific instrument (e.g., Visual Analogue Scale for headache intensity) is encouraged but should not be used to measure overall recovery.

Figure 5.2: Care Pathway for the Management of Episodic Tension-type Headaches



[a] Risk factors for serious pathologies (also known as red flags): worsening headache with fever; sudden-onset headache (thunderclap) reaching maximum intensity within 5 minutes; new-onset neurological deficit; new-onset cognitive dysfunction; change in personality; impaired level of consciousness; recent (typically within the past 3 months) head trauma; headache triggered by cough, valsalva Maneuver (trying to breathe out with nose and mouth blocked) or sneeze; headache triggered by exercise; headache that changes with posture; symptoms suggestive of giant cell arteritis; symptoms and signs of acute narrow-angle glaucoma; a substantial change in the characteristics of the patient's headache; new onset or change in headache in patients who are aged over 50; headache wakening the patient up (migraine is the most frequent cause of morning headache); patients with risk factors for cerebral venous sinus thrombosis; jaw claudication or visual disturbance; neck stiffness; new onset headache in patients with a history of human immunodeficiency virus (HIV) infection; new onset headache in patients with a history of cancer

[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness

[c] The ordering of interventions does not reflect superiority of effectiveness

[d] Based on evidence of no benefit to patients

SECTION 5.2.2

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF EPISODIC TENSION-TYPE HEADACHES

This section summarizes the key recommendations for the management of episodic tension-type headaches for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another intervention. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movements.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 5.2.2.1

STRUCTURED PATIENT EDUCATION

Structured patient education aims to enable individuals to make informed decisions about their personal health-related behaviour. Structured education strategies refer to standardized interventions such as scripted discussion, pamphlets or videos. Educational interventions should begin with an assessment of the person's knowledge of the injury and their health goals. The content of the structured education interventions may include (but is not limited to): education about the nature and course of episodic tension-type headaches; advice on return to activities; instruction on exercise; discussion of expected pain and pain mechanisms; discussion of prognosis; pain coping skills; discussion of workplace ergonomics; and self-care strategies or general health.

Table 5.B: Structured Patient Education for Episodic Tension-type Headaches

Recommendation 5.2.2.1.1	Provide information about the nature, management, and course of episodic tension-types headaches as a framework for the initiation of the program of care*
References: • Decision Determinants and Evidence Table for Headaches Associated with Neck Pain – Report 5 – Appendix 3	

* The structured education program should focus on providing advice to stay active and reassuring the patient by addressing the expectation of recovery.

SECTION 5.2.2.2

EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common to the treatment and rehabilitation of headaches associated with neck pain.

Table 5.C: Exercise for Episodic Tension-type Headaches

Recommendation 5.2.2.2.1	Consider a maximum of 8 sessions over 6 weeks of low load endurance craniocervical and cervicocapsular exercises, with resistance*
References: • Decision Determinants and Evidence Table for Headaches Associated with Neck Pain – Report 1 – Appendix 3	

* Low load endurance exercises intend to strengthen the muscles against resistance over time. These exercises should be performed for 1-8 visits over a period of 6 weeks in a supervised clinical environment. Moreover, the exercises should be done twice per day at home.

SECTION 5.2.2.3

MANUAL THERAPY

Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization and traction.

Table 5.D: Manual Therapy for Episodic Tension-type Headaches

Recommendation 5.2.2.3.1	Do not offer manipulation to the cervical spine*
References: • Decision Determinants and Evidence Table for Headaches Associated with Neck Pain – Report 3 – Appendix 3	

* Manipulation includes techniques incorporating a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion.

SECTION 5.2.3

▸ CARE PATHWAY FOR CHRONIC TENSION-TYPE HEADACHES (4-6 MONTHS POST-COLLISION)

Quick Reference Guide – Management of Chronic Tension-type Headaches

Symptoms > 3 months post-collision

For all injured persons with chronic tension-type headaches, after ruling out risk factors of serious pathologies[a]:
Offer information on nature, management, course of chronic tension-type headaches as a framework for initiation of a program of care
Conduct ongoing assessment for symptom improvement or worsening/progress during intervention and refer accordingly
Reassess and Monitor the presence of acute stress disorder, post-traumatic stress disorder, kinesiophobia, passive coping, depression, anxiety, anger, frustration and fear
Discharge injured person as appropriate at any point during intervention and recovery

Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:[b,c]

Home and clinic-based interventions:
1. General exercise (warm-up, neck and shoulder stretching and strengthening, aerobic exercises);
2. Low load endurance craniocervical and cervicoscapular exercises;
3. Multimodal care that includes the combination of spinal mobilization, craniocervical exercises, and postural correction

Refer to specific recommendation for treatment details (Section 5.2.4)

Outcome:
Recovered → Discharge
Unrecovered/Incomplete recovery or major symptom change (new condition or worsening physical, mental or psychological symptoms) → Refer to physician

[a] Risk factors for serious pathologies (also known as red flags): worsening headache with fever; sudden-onset headache (thunderclap) reaching maximum intensity within 5 minutes; new-onset neurological deficit; new-onset cognitive dysfunction; change in personality; impaired level of consciousness; recent (typically within the past 3 months) head trauma; headache triggered by cough, valsalva maneuver (trying to breathe out with nose and mouth blocked) or sneeze; headache triggered by exercise; headache that changes with posture; symptoms suggestive of giant cell arteritis; symptoms and signs of acute narrow-angle glaucoma; a substantial change in the characteristics of the patient's headache; new onset or change in headache in patients who are aged over 50; headache wakening the patient up (migraine is the most frequent cause of morning headache); patients with risk factors for cerebral venous sinus thrombosis; jaw claudication or visual disturbance; neck stiffness; new onset headache in patients with a history of human immunodeficiency virus (HIV) infection; new onset headache in patients with a history of cancer
[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness
[c] The ordering of interventions does not reflect superiority of effectiveness

The care pathway for chronic tension-type headaches is presented in Figure 5.3.

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about headaches and address any misunderstandings or apprehension through education and reassurance. The health care professional needs to educate and reassure the patient about the nature and course of chronic tension-type

headaches. In the presence of prognostic factors for delayed recovery, the health care professional should discuss them with the patient and adjust their care plan accordingly.

Determine if Ongoing Clinical Care is Necessary

Health care professionals should first determine if the patient requires ongoing clinical care. Patients with chronic tension-type headache may not require ongoing clinical care. Rather, patients can be managed with reassurance and education.

Deliver the Care Plan

Patients with chronic tension-type headaches requiring clinical care should be encouraged to participate in their program of care by remaining active and doing home exercises on a regular basis. Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:

- A general exercise program that includes warm-up, neck and shoulder stretching and strengthening, aerobic exercise.
- Low load endurance craniocervical and cervicoscapular exercises.
- Multimodal care that includes the combination of spinal mobilization, craniocervical exercises, and postural correction.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

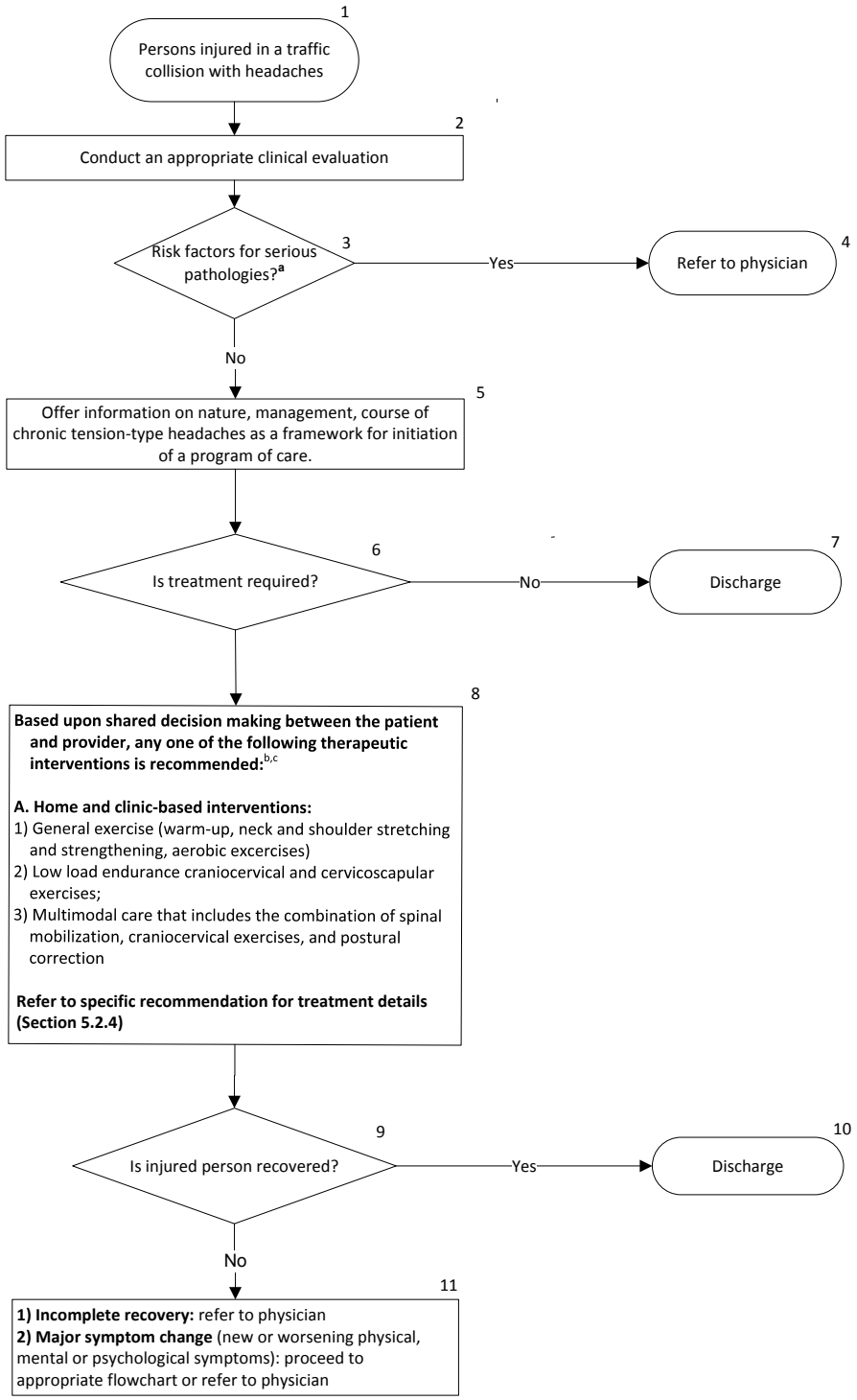
Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: “How well do you feel you are recovering from your injuries?” The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be ‘completely better’ or ‘much improved’ should be considered recovered. Patients who have not recovered should follow the care pathway outlined in this guideline.*

Patients with worsening symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who have not improved significantly or recovered should be referred to their physician for further evaluation.

* The use of a valid and reliable condition-specific instrument (e.g., Visual Analogue Scale for headache intensity) is encouraged but should not be used to measure overall recovery.

Figure 5.3: Care Pathway for the Management of Chronic Tension-type Headaches



[a] Risk factors for serious pathologies (also known as red flags): worsening headache with fever; sudden-onset headache (thunderclap) reaching maximum intensity within 5 minutes; new-onset neurological deficit; new-onset cognitive dysfunction; change in personality; impaired level of consciousness; recent (typically within the past 3 months) head trauma; headache triggered by cough, valsalva Maneuver (trying to breathe out with nose and mouth blocked) or sneeze; headache triggered by exercise; headache that changes with posture; symptoms suggestive of giant cell arteritis; symptoms and signs of acute narrow-angle glaucoma; a substantial change in the characteristics of the patient's headache; new onset or change in headache in patients who are aged over 50; headache wakening the patient up (migraine is the most frequent cause of morning headache); patients with risk factors for cerebral venous sinus thrombosis; jaw claudication or visual disturbance; neck stiffness; new onset headache in patients with a history of human immunodeficiency virus (HIV) infection; new onset headache in patients with a history of cancer

[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness

[c] The ordering of interventions does not reflect superiority of effectiveness

SECTION 5.2.4

KEY RECOMMENDATIONS FOR THE CLINICAL MANAGEMENT OF CHRONIC TENSION-TYPE HEADACHES

This section summarizes the key recommendations for the management of chronic tension-type headaches for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another intervention. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movements.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 5.2.4.1

STRUCTURED PATIENT EDUCATION

Structured patient education aims to enable individuals to make informed decisions about their personal health-related behaviour. Structured education strategies refer to standardized interventions such as scripted discussion, pamphlets or videos. Educational interventions should begin with an assessment of the person's knowledge of the injury and their health goals. The content of the structured education interventions may include (but is not limited to): education about the nature and course of chronic tension-type headaches; advice on return to activities; instruction of exercise; discussion of expected pain and pain mechanisms; discussion of prognosis; pain coping skills; discussion of workplace ergonomics; and self-care strategies or general health.

Table 5.E: Structured Patient Education for Chronic Tension-type Headaches

Recommendation 5.2.4.1.1	Provide information about the nature, management, and course of chronic tension-type headaches as a framework for the initiation of the program of care*
References: • Decision Determinants and Evidence Table for Headaches Associated with Neck Pain – Report 5 – Appendix 3	

* The structured education program should focus on providing advice to stay active and reassuring the patient by addressing the expectation of recovery.

SECTION 5.2.4.2

▸ EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common to the treatment and rehabilitation of headaches associated with neck pain.

Table 5.F: Exercise for Chronic Tension-type Headaches

Recommendation 5.2.4.2.1	Consider a maximum of 25 sessions over 12 weeks of general exercise (warm-up, neck and shoulder stretching and strengthening, aerobic exercise)*
5.2.4.2.2	Consider a maximum of 8 sessions over 6 weeks of low load endurance craniocervical and cervicocapsular exercises, with resistance**
References: • Decision Determinants and Evidence Table for Headaches Associated with Neck Pain – Report 1 – Appendix 3	

* These exercises should be performed for 1-25 visits over a period of 12 weeks in a supervised clinical environment and at home.
** Low load endurance exercises intend to strengthen the muscles against resistance over time. These exercises should be performed for 1-8 visits over a period of 6 weeks in a supervised clinical environment. Moreover, the exercises should be done twice per day at home.

SECTION 5.2.4.3

▸ MULTIMODAL CARE

Multimodal care includes at least two distinct therapeutic modalities, provided by one or more health care disciplines. The evidence suggests that three interventions should be included in multimodal care: exercise, spinal mobilization, and postural correction.

Table 5.G: Multimodal Care for Chronic Tension-type Headaches

Recommendation 5.2.4.3.1	Offer a maximum of 9 sessions over 8 weeks of multimodal care that includes spinal mobilization*, craniocervical exercises, and postural correction**
References: • Decision Determinants and Evidence Table for Headaches Associated with Neck Pain – Report 4 – Appendix 3	

* Spinal mobilization refers to techniques incorporating a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion.
** Multimodal care should be performed for 1-9 visits over a period of 8 weeks.

Quick Reference Guide – Management of Cervicogenic Headaches

Symptoms > 3 months post-collision

For all injured persons with cervicogenic headaches, after ruling out risk factors of serious pathologies[a]:
Offer information on nature, management, course of cervicogenic headaches as a framework for initiation of a program of care
Conduct ongoing assessment for symptom improvement or worsening/progress during intervention and refer accordingly
Reassess and Monitor the presence of acute stress disorder, post-traumatic stress disorder, kinesiophobia, passive coping, depression, anxiety, anger, frustration and fear
Discharge injured person as appropriate at any point during intervention and recovery

Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:[b,c]

Home and clinic-based interventions[b,c]:
1. Low load endurance craniocervical and cervicoscapular exercises;
2. Manual therapy (manipulation with or without mobilization) to the cervical and thoracic spine

Refer to specific recommendation for treatment details (Section 5.2.6)

Do Not Offer:[d]
- Multimodal program of care that includes the combination of spinal manipulation, spinal mobilization, and low load endurance exercises

Outcome:
Recovered → Discharge
Unrecovered/Incomplete recovery or major symptom change (new condition or worsening physical, mental or psychological symptoms) → Refer to physician

[a] Risk factors for serious pathologies (also known as red flags): worsening headache with fever; sudden-onset headache (thunderclap) reaching maximum intensity within 5 minutes; new-onset neurological deficit; new-onset cognitive dysfunction; change in personality; impaired level of consciousness; recent (typically within the past 3 months) head trauma; headache triggered by cough, valsalva maneuver (trying to breathe out with nose and mouth blocked) or sneeze; headache triggered by exercise; headache that changes with posture; symptoms suggestive of giant cell arteritis; symptoms and signs of acute narrow-angle glaucoma; a substantial change in the characteristics of the patient's headache; new onset or change in headache in patients who are aged over 50; headache wakening the patient up (migraine is the most frequent cause of morning headache); patients with risk factors for cerebral venous sinus thrombosis; jaw claudication or visual disturbance; neck stiffness; new onset headache in patients with a history of human immunodeficiency virus (HIV) infection; new onset headache in patients with a history of cancer
[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness
[c] The ordering of interventions does not reflect superiority of effectiveness
[d] Based on evidence of no benefit to patients

The care pathway for cervicogenic headaches is presented in Figure 5.4.

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about headaches and address any misunderstandings or apprehension through education and reassurance. The health care professional needs to educate and reassure the patient about the nature and course of cervicogenic headaches. In the presence of prognostic factors for delayed recovery, the health care professional should discuss them with the patient and adjust their care plan accordingly.

Determine if Ongoing Clinical Care is Necessary

Health care professionals should first determine if the patient requires ongoing clinical care. Patients with cervicogenic headaches may not require ongoing clinical care. Rather, patients can be managed with reassurance and education.

Deliver the Care Plan

Patients with cervicogenic headaches requiring clinical care should be encouraged to participate in their program

of care by remaining active and doing home exercises on a regular basis. Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:

- Low load endurance craniocervical and cervicoscapular exercises
- Manual therapy (manipulation with or without mobilization) to the cervical and thoracic spine

Interventions that are not recommended include:

- Manual therapy and low load endurance craniocervical and cervicoscapular exercises are effective on their own. However, combining these interventions does not add benefit to the patients. Therefore, multimodal program of care that combines spinal manipulation, spinal mobilization, and low load endurance exercises should not be offered to these patients.

Discuss the risks and benefits of the care plan with the patient.

Reassess and Take the Indicated Course of Action

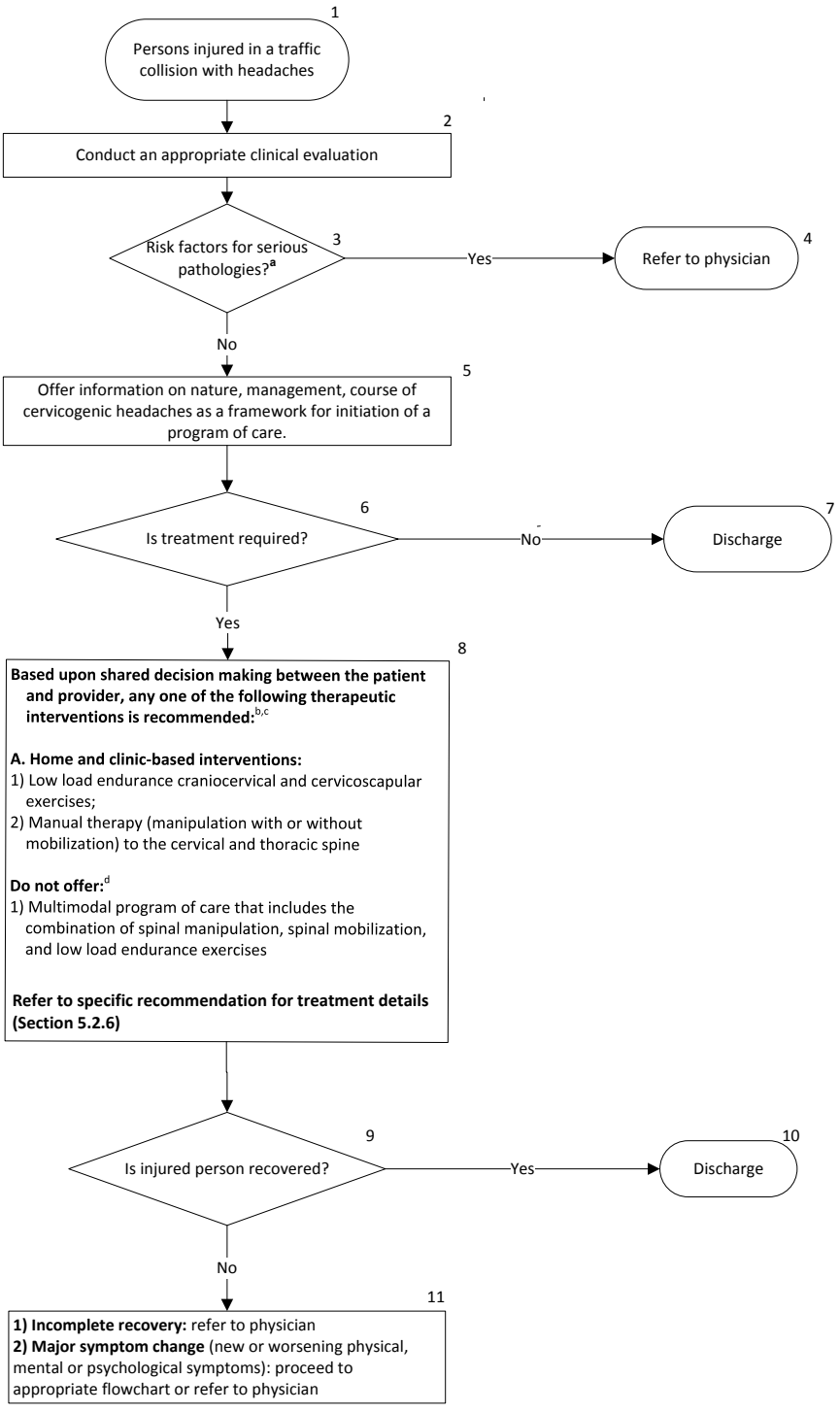
Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening. Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered. Patients who have not recovered should follow the care pathway outlined in this guideline.*

Patients with worsening symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who have not improved significantly or recovered should be referred to their physician for further evaluation.

* The use of a valid and reliable condition-specific instrument (e.g., Visual Analogue Scale for headache intensity) is encouraged but should not be used to measure overall recovery.

Figure 5.4: Care Pathway for the Management of Cervicogenic Headaches



[a] Risk factors for serious pathologies (also known as red flags): worsening headache with fever; sudden-onset headache (thunderclap) reaching maximum intensity within 5 minutes; new-onset neurological deficit; new-onset cognitive dysfunction; change in personality; impaired level of consciousness; recent (typically within the past 3 months) head trauma; headache triggered by cough, valsalva maneuver (trying to breathe out with nose and mouth blocked) or sneeze; headache triggered by exercise; headache that changes with posture; symptoms suggestive of giant cell arteritis; symptoms and signs of acute narrow-angle glaucoma; a substantial change in the characteristics of the patient's headache; new onset or change in headache in patients who are aged over 50; headache wakening the patient up (migraine is the most frequent cause of morning headache); patients with risk factors for cerebral venous sinus thrombosis; jaw claudication or visual disturbance; neck stiffness; new onset headache in patients with a history of human immunodeficiency virus (HIV) infection; new onset headache in patients with a history of cancer

[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness

[c] The ordering of interventions does not reflect superiority of effectiveness

[d] Based on evidence of no benefit to patients

SECTION 5.2.6

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF CERVICOGENIC HEADACHES

This section summarizes the key recommendations for the management of persistent cervicogenic headaches for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movements.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 5.2.6.1

STRUCTURED PATIENT EDUCATION

Structured patient education aims to enable individuals to make informed decisions about their personal health-related behaviour. Structured education strategies refer to standardized interventions such as scripted discussion, pamphlets or videos. Educational interventions should begin with an assessment of the person's knowledge of the injury and their health goals. The content of the structured education interventions may include (but is not limited to): education about the nature and course of persistent cervicogenic headaches; advice on return to activities; instruction of exercise; discussion of expected pain and pain mechanism; discussion of prognosis; pain coping skills; discussion of workplace ergonomics; and self-care strategies or general health.

Table 5.H: Structured Patient Education for Cervicogenic Headaches

Recommendation 5.2.6.1.1	Provide information about the nature, management, and course of persistent cervicogenic headaches as a framework for the initiation of the program of care*
References: • Decision Determinants and Evidence Table for Headaches Associated with Neck Pain – Report 5 – Apendix 3	

* The structured education program should focus on providing advice to stay active and reassuring the patient by addressing the expectation of recovery.

SECTION 5.2.6.2

EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common to the treatment and rehabilitation of headaches associated with neck pain.

Table 5. I: Exercise for Cervicogenic Headaches

Recommendation 5.2.6.2.1	Consider a maximum of 8 sessions over 6 weeks of low load endurance craniocervical and cervicoscapular exercise, with resistance*
References: • Decision Determinants and Evidence Table for Headaches Associated with Neck Pain – Report 1 – Appendix 3	

* Low load endurance exercises intend to strengthen the muscles against resistance over time. These exercises should be performed for 1-8 visits over a period of 6 weeks in a supervised clinical environment. Moreover, the exercises should be done twice per day at home.

SECTION 5.2.6.3

MULTIMODAL CARE

Multimodal care includes at least two distinct therapeutic modalities, provided by one or more health care disciplines.

Table 5.J: Multimodal Care for Cervicogenic Headaches

Recommendation 5.2.6.3.1	Do not offer a multimodal program of care that combines spinal manipulation*, spinal mobilization**, and low load endurance exercises***
References: • Decision Determinants and Evidence Table for Headaches Associated with Neck Pain – Report 4 – Appendix 3	

* Spinal manipulation refers to techniques incorporating a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion.
** Spinal mobilization refers to techniques incorporating a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion.
*** Low load endurance exercises intend to strengthen the muscles against resistance over time.

SECTION 5.2.6.4

MANUAL THERAPY

Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization and traction.

Table 5.K: Manual Therapy for Cervicogenic Headaches

Recommendation 5.2.6.4.1	Consider a maximum of 12 sessions over 7 weeks of manual therapy (manipulation with or without mobilization)* to the cervical and thoracic spine*
References: • Decision Determinants and Evidence Table for Headaches Associated with Neck Pain – Report 3 – Appendix 3	

* Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation and mobilization. Manipulation refers to techniques incorporating a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion. Mobilization refers to techniques incorporating a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion. Manual therapy should be performed for 1-12 visits over a period of 7 weeks.

Appendix 5.A

INTERNATIONAL CLASSIFICATION OF HEADACHE DISORDERS SECOND EDITION (ICHD-2) CRITERIA FOR THE DIAGNOSIS OF TENSION-TYPE AND CERVICOGENIC HEADACHES*

Headache Type	Classification Criteria
Tension-Type	ICHD-2 Criteria: Tension-type headaches can be classified as: 1) frequent episodic tension-type headache with or without pericranial tenderness; or 2) chronic tension-type headache with or without pericranial tenderness. The presence of pericranial tenderness is indicated by increased tenderness on manual palpation of head and neck muscles, which include, but may not be limited to the following: frontal, temporal, masseter, pterygoid, sternocleidomastoid, splenius and trapezius muscles. Diagnostic criteria for **frequent episodic tension-type** headache: A. At least 10 episodes occurring on ≥1 but <15 days per month for at least 3 months (≥12 and <180 days per year) and fulfilling criteria B-D B. Headache lasting from 30 minutes to 7 days C. Headache has at least two of the following characteristics: 1. bilateral location 2. pressing, tightening or non-pulsating quality 3. mild or moderate intensity 4. not aggravated by routine physical activity such as walking or climbing stairs D. Both of the following: 1. no nausea or vomiting (but anorexia may occur) 2. no more than one of photophobia or phonophobia E. Not attributed to another disorder Diagnostic criteria for **chronic tension-type** headache: A. Headache occurring on ≥15 days per month on average for >3 months (≥180 days per year) and fulfilling criteria B-D B. Headache lasts hours or may be continuous C. Headache has at least two of the following characteristics: 1. bilateral location 2. pressing, tightening or non-pulsating quality 3. mild or moderate intensity 4. not aggravated by routine physical activity such as walking or climbing stairs. D. Both of the following: 1. no more than one of photophobia, phonophobia or mild nausea 2. neither moderate or severe nausea nor vomiting E. Not attributed to another disorder

* Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders: 2nd edition. Cephalagia 2004; 24 Suppl 1:9-160.

Headache Type	Classification Criteria
Cervicogenic	Diagnostic criteria for cervicogenic headache: A. Pain, referred from a source in the neck and perceived in one or more regions of the head and/or face, and fulfilling criteria A and D[a] B. Clinical, laboratory and/or imaging evidence of a disorder or lesion within the cervical spine or soft tissues of the neck known to be, or generally accepted as, a valid cause of headache C. Evidence that the pain can be attributed to the neck disorder or lesion based on at least one of the following: 1. demonstration of clinical signs that implicate a source of pain in the neck.[b] 2. abolition of headache following diagnostic blockade of a cervical structure or its nerve supply using placebo- or other adequate controls.[c] D. Pain resolves within 3 months after successful treatment of the causative disorder or lesion.

a. Tumours, fractures, infections and rheumatoid arthritis of the upper cervical spine have not been validated formally as causes of headache, but are nevertheless accepted as valid causes when demonstrated to be so in individual cases. Cervical spondylosis and osteochondritis are NOT accepted as valid causes fulfilling criterion B. When myofascial tender spots are the cause, the headache should be coded under 2. Tension-type headache.

b. Clinical signs acceptable for criterion C1 must have demonstrated reliability and validity. The future task is the identification of such reliable and valid operational tests. Clinical features such as neck pain, focal neck tenderness, history of neck trauma, mechanical exacerbation of pain, unilaterality, coexisting shoulder pain, reduced range of motion in the neck, nuchal onset, nausea, vomiting, photophobia etc are not unique to cervicogenic headache. These may be features of cervicogenic headache, but they do not define the relationship between the disorder and the source of the headache.

c. Abolition of headache means complete relief of headache, indicated by a score of zero on a visual analogue scale (VAS). Nevertheless, acceptable as fulfilling criterion C2 is ≥90% reduction in pain to a level of <5 on a 100-point VAS.

SECTION 6.0

GUIDELINE FOR THE CLINICAL MANAGEMENT OF SOFT TISSUE DISORDERS OF THE UPPER EXTREMITY

This evidence-based guideline establishes the best practice for the clinical management of soft tissue disorders of the upper extremity caused or exacerbated by a motor vehicle collision. This guideline covers recent onset (0-3 months post-collision) and persistent (4-6 months post-collision) epicondylitis (medial and lateral)*, shoulder pain, and shoulder pain with calcific tendinitis; it does not cover disorders that persist for more than 6 months post-collision.

In this guideline, the upper extremity is defined as the region that includes the shoulder, arm, elbow, forearm, wrist and hand.

Upper extremity soft tissue disorders refer to grades I and II sprains or strains, bursitis and tendinitis of the upper extremity. Strains and sprains can be classified into three grades, distinguished by the severity of signs and symptoms, and structural disruption (Table 6.A and Table 6.B). This guideline is not indicated for conditions that include the presence of major structural or other pathological causes of the upper extremity such as fractures, dislocations, osteoarthritis, neuropathies, inflammatory disorders, systemic diseases, infections, tumors and grade III sprains/strains.

* The evidence used to develop the care pathways for epicondylitis was obtained from randomized controlled trials on the management of lateral epicondylitis. The recommendations were extended to the management of medial epicondylitis because of the patho-anatomic similarities between the two injuries.

6.0 GUIDELINE FOR THE CLINICAL MANAGEMENT OF SOFT TISSUE DISORDERS OF THE UPPER EXTREMITY

Table 6.A. The American Academy of Orthopaedic Surgeons Classification of Sprains

Grade	Definition
I	Ligamentous fibres are stretched but remain structurally intact
II	Ligamentous fibres become partially torn and physical stress reveals increased laxity with a definite end point
III	A ligament is completely torn, leading to gross instability

Table 6.B. The American Academy of Orthopaedic Surgeons Classification of Strains

Grade	Definition
I	Less than 5% of muscle/tendon fibres are disrupted, with fascia remaining intact
II	Muscle fibre/tendon discontinuity involves a moderate number of muscle fibres
III	There is complete discontinuity in the muscle fibres

Upper extremity injuries are common following motor vehicle collisions. In a Canadian population-based cohort, 75% of injured adults reported posterior shoulder pain and 35% reported upper extremity pain within 30 days after a motor vehicle collision.

The clinical management recommended in this guideline aims to: 1) accelerate recovery; 2) reduce the intensity of symptoms; 3) promote early restoration of function; 4) prevent chronic pain and disability; 5) improve health-related quality of life; 6) reduce recurrences; and 7) promote active participation of patients in their care.

Patients with multiple injuries should be managed using all appropriate care pathways. For example, patients with upper extremity soft tissue disorders commonly suffer from neck pain. Patients with upper extremity soft tissue disorders and neck pain and its associated disorders (NAD) should also receive care as recommended in the NAD care pathways described in Chapter 4.

Patient-centered care is an internationally recognized principle that was fundamental to the development of this guideline. This guideline reinforces the importance of communication and partnership between patients and health care professionals.

All recommendations included in this guideline are based on studies with low risk of bias.

Interventions not described in this guideline are not recommended for the management of patients with upper extremity soft tissue disorders because of a lack of evidence about their effectiveness and safety.

6.0 GUIDELINE FOR THE CLINICAL MANAGEMENT OF SOFT TISSUE DISORDERS OF THE UPPER EXTREMITY

Health care professionals eligible to provide care under this guideline are those defined by the Statutory Accident Benefits Schedules (SABS).

This guideline is organized in three sections. Each section provides evidence-based recommendations for the clinical management of various types and durations of upper extremity soft tissue disorders:

- Section 6.1 - Management of epicondylitis
- Section 6.2 - Management of shoulder pain
- Section 6.3 - Management of shoulder pain with calcific tendinitis

All recommendations presented in this guideline integrate the:

- Key decision determinants based upon the framework developed by the Ontario Health Technology Advisory Committee (OHTAC);
- Best evidence obtained from a critical review of current scientific literature; and
- Qualitative research exploring the experiences of persons treated for traffic injuries in Ontario

All background documents and references are available at http://www.fsco.gov.on.ca

SECTION 6.1

MANAGEMENT OF EPICONDYLITIS

Quick Reference Guide – Management of Epicondylitis

Symptoms ≤ 3 months post-collision	Symptoms > 3 months post-collision
For all injured persons with epicondylitis: **Rule out** risk factors for serious pathologies[a] **Offer** information on nature, management, course of epicondylitis as a framework for initiation of a program of care **Conduct** ongoing assessment for symptom improvement or worsening/progress during intervention and refer accordingly **Discharge** injured person as appropriate at any point during intervention and recovery	
Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended: **Home and clinic based interventions:**[b,c,d] 1. Elbow brace (lateral epicondylitis) 2. Multimodal care that includes the combination of: a) Elbow manipulation or mobilization b) Deep tissue massage c) Forearm strengthening and stretching exercise d) Advice to stay active, and ergonomic and activity modification to avoid symptom provocation **Refer to specific recommendation for treatment details (Section 6.1.3)**	**Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:** **Home and clinic based interventions:**[b,c,d] 1. Muscle energy technique 2. Myofascial release 3. Elbow brace (lateral epicondylitis) 4. Home-based strengthening and/or stretching exercise 5. Multimodal care that includes the combination of (if not previously given in 1st 3 months of care): a) Elbow manipulation or mobilization b) Deep tissue massage c) Forearm strengthening and stretching exercise d) Advice to stay active, and ergonomic and activity modification to avoid symptom provocation **Refer to specific recommendation for treatment details (Section 6.1.4)**
Do Not Offer:[e] • Transcutaneous electrical nerve stimulation (TENS) • Elbow brace added to multimodal physical therapy (lateral epicondylitis)	**Do Not Offer:**[e] • Transcutaneous electrical nerve stimulation (TENS) • Elbow brace added to multimodal physical therapy (lateral epicondylitis)
Outcome: **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Initiate persistent protocol **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician	**Outcome:** **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Refer to physician **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician

[a] Risk factors for serious pathologies (also known as red flags): History of significant trauma; history of inflammatory arthritis; history of unexplained, significant weight loss; fever; painful, swollen joints; progressive/widespread neurological symptoms/signs; severe, unremitting, night-time pain; widespread, unexplained pain; unremitting pain when at rest
[b] For medial epicondylitis, special caution should be exercised to protect the ulnar nerve
[c] This guideline does not include interventions for which there is a lack of evidence of effectiveness
[d] The ordering of interventions does not reflect superiority of effectiveness
[e] Based on evidence of no benefit to patients

SECTION 6.1.1

CARE PATHWAY FOR RECENT ONSET EPICONDYLITIS (0 - 3 MONTHS POST-COLLISION)

The care pathway is presented in Figure 6.1

At initial contact, health care professionals should educate and reassure the patient that epicondylitis will resolve within a few months of symptom onset. Patients greatly improve their recovery by actively participating in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first 3 months of care for epicondylitis is described below.*

* Special caution should be exercised to protect the ulnar nerve when treating medial epicondylitis

Assess the Patient with Epicondylitis

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the epicondylitis care pathway.

Table 6.C Risk factors of serious pathology (red flags) for epicondylitis

Risk factors of serious pathology identified during history or physical examination*
• History of significant trauma • History of inflammatory arthritis • History of unexplained, significant weight loss • Fever • Painful, swollen joints • Progressive/widespread neurological symptoms/signs • Severe, unremitting night-time pain • Widespread, unexplained pain • Unremitting pain when at rest

Patients who also have neck pain and associated disorders or other injuries should be managed using the appropriate care pathways.

Patients with multiple injuries should be managed using all appropriate care pathways.

Educate and Reassure the Patient

A patient-centred care plan should be developed in partnership with the patient. It is important that the health care professional reassures and explains to patients that most individuals recover spontaneously from epicondylitis. Patients need to be reassured about the benign and self-limited nature of epicondylitis. Health care professionals also need to reassure patients that there are no major structural or progressive pathologies (e.g., dislocations, fractures or infection) in the elbow.

Determine if Ongoing Clinical Care is Necessary

Health care professionals should first determine if the patient requires clinical care.

* This list of risk factors of serious pathology was informed by the following clinical practice guideline: Accident Compensation Corporation (ACC). Distal upper limb. Guidelines for management of some common musculoskeletal disorders. New Zealand; 2009. Available from: http://www.acc.co.nz/PRD_EXT_CSMP/groups/external_communications/documents/guide/prd_ctrb112931.pdf [Last accessed 14 Dec 2014]

Deliver the Care Plan for Recent Onset Epicondylitis (0-3 months post-collision)

Patients who require clinical care should be encouraged to actively participate in their care by staying active.

Health care professionals should discuss treatment options with their patients and, through a process of shared decision making, determine which therapeutic options they wish to pursue. Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:

- Elbow brace (lateral epicondylitis)
- Multimodal care that includes the combination of:
  i. Elbow manipulation or mobilization
  ii. Deep tissue massage
  iii. Forearm strengthening and stretching exercise
  iv. Advice to stay active, and ergonomic and activity modification to avoid symptom provocation

Interventions that are not recommended include:

- Transcutaneous electrical nerve stimulation (TENS)
- Elbow brace added to multimodal physical therapy (lateral epicondylitis)

Discuss the risks and benefits of the care plan with the patient.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: “How well do you feel you are recovering from your injuries?” The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be ‘completely better’ or ‘much improved’ should be considered recovered. Patients who have not recovered should follow the care pathway outlined in this guideline*.

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to a physician for further evaluation at any time point during their care.

Patients who have not significantly improved or recovered within the first 3 months after the injury should enter the care pathway for persistent epicondylitis described in section 6.1.2.

* The use of a valid and reliable condition-specific instrument (e.g. Disabilities of the Arm, Shoulder and Hand (DASH)) is encouraged but should not be used to measure overall recovery.

The care pathway is presented in Figure 6.1

Patients who still experience symptoms and disability more than 3 months after the injury may benefit from receiving additional clinical care. The primary goals of clinical care are to promote recovery by reducing symptoms and return patients to their normal activities of daily living.*

Assess the Patient with Epicondylitis

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the epicondylitis care pathway.

Table 6.C Risk factors of serious pathology (red flags) for epicondylitis

Risk factors of serious pathology identified during history or physical examination[+]
• History of significant trauma • History of inflammatory arthritis • History of unexplained, significant weight loss • Fever • Painful, swollen joints • Progressive/widespread neurological symptoms/signs • Severe, unremitting night-time pain • Widespread, unexplained pain • Unremitting pain when at rest

Patients who also have neck pain and associated disorders or other injuries should be managed using the appropriate care pathways.

Patients with multiple injuries should be managed using all appropriate care pathways.

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about epicondylitis and address any misunderstandings or apprehension through education and reassurance. The health care

* Special caution should be exercised to protect the ulnar nerve when treating medial epicondylitis.

[+] This list of risk factors of serious pathology was informed by the following clinical practice guideline: Accident Compensation Corporation (ACC). Distal upper limb. Guidelines for management of some common musculoskeletal disorders. New Zealand; 2009. Available from: http://www.acc.co.nz/PRD_EXT_CSMP/groups/external_communications/documents/guide/prd_ctrb112931.pdf [Last accessed 14 Dec 2014]

professional needs to educate and reassure the patient about the benign and self-limited nature of epicondylitis and reinforce the importance of maintaining activities of daily living.

Deliver the Care Plan for Persistent Epicondylitis (4-6 months post-collision)

The goal of the care plan is to provide clinical interventions that promote resolution of symptoms and restoration of function. Patients requiring clinical care should be encouraged to participate in their program of care by remaining active.

Health care professionals should discuss treatment options with their patients and, through a process of shared decision making, determine which therapeutic options they wish to pursue. Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:

- Muscle energy technique
- Myofascial release
- Elbow brace (lateral epicondylitis)
- Home-based strengthening and/or stretching exercise
- Multimodal care that includes the combination of (if not previously given in 1st 3 months of care):
  - i. Elbow manipulation or mobilization
  - ii. Deep tissue massage
  - iii. Forearm strengthening and stretching exercise
  - iv. Advice to stay active, and ergonomic and activity modification to avoid symptom provocation

Interventions that are not recommended include:

- Transcutaneous electrical nerve stimulation (TENS)
- Elbow brace added to multimodal physical therapy (lateral epicondylitis)

Discuss the risks and benefits of the care plan with the patient.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: “How well do you feel you are recovering from your injuries?” The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be ‘completely better’ or ‘much improved’ should be considered recovered. Patients who have not recovered should follow the care pathway outlined in this guideline*.

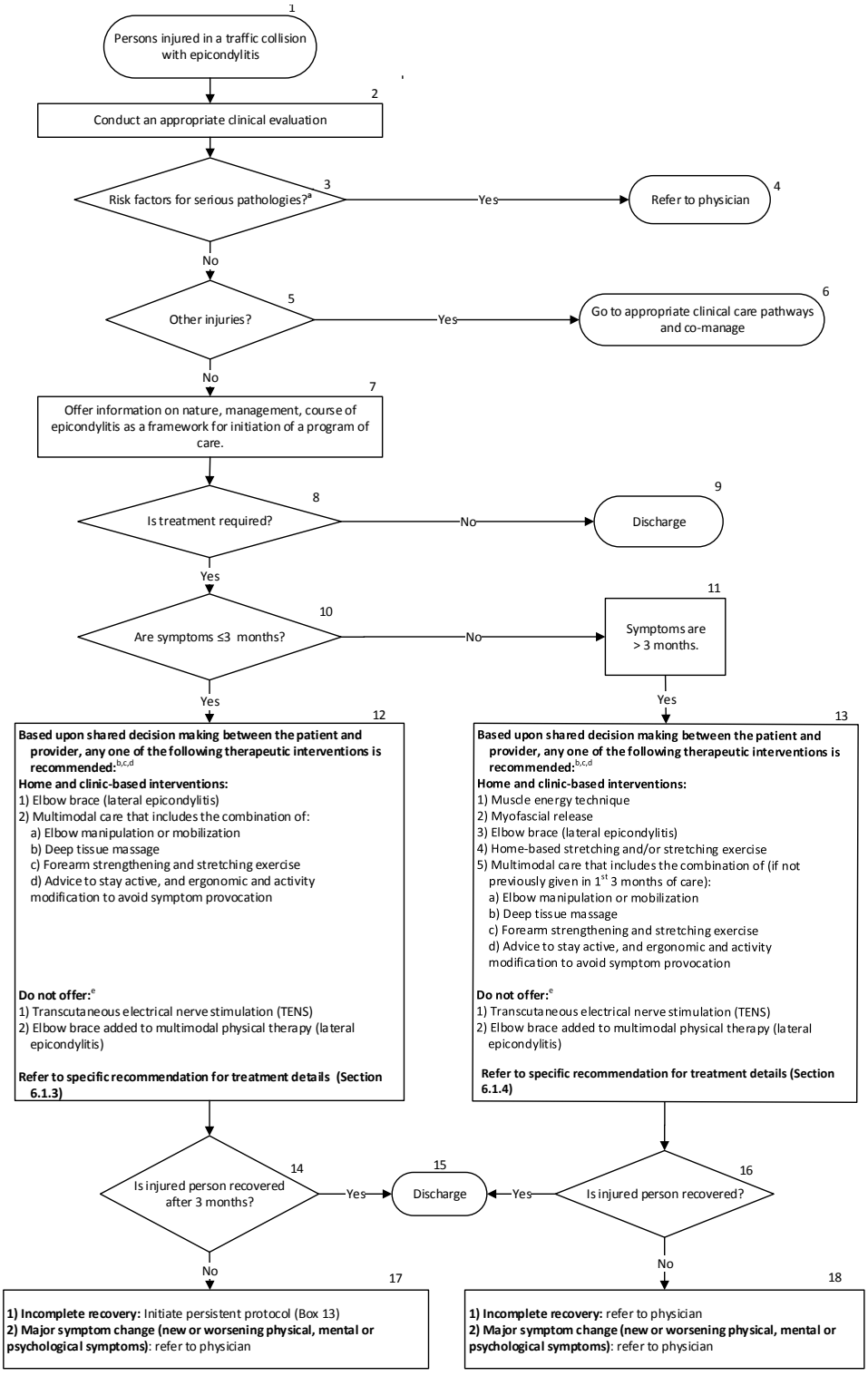
Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to a physician for further evaluation at any time point during their care.

* The use of a valid and reliable condition-specific instrument (e.g. Disabilities of the Arm, Shoulder and Hand (DASH)) is encouraged but should not be used to measure overall recovery.

6.1.2 CARE PATHWAY FOR PERSISTENT EPICONDYLITIS (4 - 6 MONTHS POST-COLLISION)

Patients who have not improved significantly or recovered should be referred to their physician for further evaluation.

Figure 6.1: Care Pathway for the Management of Epicondylitis



[a] Risk factors for serious pathologies (also known as red flags): History of significant trauma; history of inflammatory arthritis; history of unexplained significant weight loss; fever; painful, swollen joints; progressive/widespread neurological symptoms/signs; severe, unremitting, night-time pain; widespread, unexplained pain; unremitting pain when at rest

[b] For medial epicondylitis, special caution should be exercised to protect the ulnar nerve

[c] This guideline does not include interventions for which there is a lack of evidence of effectiveness

[d] The ordering of interventions does not reflect superiority of effectiveness

[e] Based on evidence of no benefit to patients

SECTION 6.1.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT ONSET EPICONDYLITIS

This section summarizes the key recommendations for the management of recent onset epicondylitis for the period extending from 0 to 3 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 6.1.3.1

MULTIMODAL CARE

Multimodal care includes at least two distinct therapeutic modalities, provided by one or more health care disciplines.

Table 6.D: Multimodal Care for Recent Onset Epicondylitis

Recommendation 6.1.3.1.1	Consider a maximum of 10 visits over 5 weeks of multimodal care that includes manual therapy*, deep tissue massage**, exercise*** and education****.

References:
- Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 5 – Appendix 4

* Mobilization: a) Sustained Lateral Glide With Pain-Free Grip: a sustained lateral glide across the elbow joint while the patient performs a gripping action; b) Sustained Lateral Glide with Movement: If there is also reproduction of pain with elbow movement, perform the lateral glide while the movement is repeated; c) Sustained Posterior-Anterior Glide with Pain-Free Grip: In the event (a) and (b) are not effective, attempt a sustained posteror-anterior glide of the radio-humeral joint.
Manipulation: patient seated with upper extremity in 90 degrees of abduction with internal rotation so that the olecranon faces up. Stabilize wrist

in full flexion and pronation with one hand and place the other hand over the olecranon. Deliver a high-velocity low amplitude thrust at the end of range of elbow extension.
** 10 minutes of deep transverse friction massage followed by manipulation
*** Exercise: supervised and home exercise including: progressive, slow, repetitive wrist and forearm stretches; 8-12 repetitions of progressive loaded exercise for wrist extension/flexion, supination/pronation, radial/ulnar deviation, pain-free grip, 3 sets, 2-3 times per week. Include work-specific tasks and activities before re-introduction into the workforce. Include other upper quadrant muscle deficiency, and correction of postural alignment and upper limb movements as clinically indicated.
**** Education: provide written information outlining the epicondylitis disease process, practical advice on self-management and ergonomics, and activity modification to avoid provocation of symptoms while remaining as active as possible.

SECTION 6.1.3.2

PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 6.E: Passive Physical Modalities for Recent Onset Epicondylitis

Recommendation 6.1.3.2.1	Consider an elbow brace worn over the common extensor tendon during the daytime for 6 weeks (for lateral epicondylitis).
6.1.3.2.2	Do not offer transcutaneous electrical nerve stimulation (TENS).*
6.1.3.2.3	Do not add an elbow brace to multimodal physical therapy (for lateral epicondylitis).
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 6 – Appendix 4	

* Transcutaneous electrical nerve stimulation (TENS) is a passive physical modality connected to the skin, using two or more electrodes to apply low level electrical current. It is typically used with the intent to help pain management.

SECTION 6.1.4

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT EPICONDYLITIS

This section summarizes the key recommendations for the management of persistent epicondylitis for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 6.1.4.1

EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common to the treatment and rehabilitation of elbow pain.

Table 6.F: Exercise for Persistent Epicondylitis

Recommendation 6.1.4.1.1	Consider home-based stretching and/or strengthening exercise. The program should consist of 15 repetitions of progressive incremental loading exercises for forearm extensors, 3 sets daily for 3 months; and/or 3 repetitions of wrist extensor stretches, twice daily for 6 weeks.
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 4 – Appendix 4	

SECTION 6.1.4.2

▸ MULTIMODAL CARE

Multimodal care includes at least two distinct therapeutic modalities, provided by one or more health care disciplines.

Table 6.G: Multimodal Care for Persistent Epicondylitis

Recommendation 6.1.4.2.1	Consider a maximum of 10 visits over 5 weeks of multimodal care that includes manual therapy*, deep tissue massage**, exercise*** and education****.

References:

- Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 5 – Appendix 4

* Mobilization: a) Sustained Lateral Glide With Pain-Free Grip: a sustained lateral glide across the elbow joint while the patient performs a gripping action; b) Sustained Lateral Glide with Movement: If there is also reproduction of pain with elbow movement, perform the lateral glide while the movement is repeated; c) Sustained Posterior-Anterior Glide with Pain-Free Grip: In the event (a) and (b) are not effective, attempt a sustained posterior-anterior glide of the radio-humeral joint.
Manipulation: patient seated with upper extremity in 90 degrees of abduction with internal rotation so that the olecranon faces up. Stabilize wrist in full flexion and pronation with one hand and place the other hand over the olecranon. Deliver a high-velocity low amplitude thrust at the end or range of elbow extension.
** 10 minutes of deep transverse friction massage followed by manipulation
*** Exercise: supervised and home exercise including: progressive, slow, repetitive wrist and forearm stretches; 8-12 repetitions of progressive loaded exercise for wrist extension/flexion, supination/pronation, radial/ulnar deviation, pain-free grip, 3 sets, 2-3 times per week. Include work-specific tasks and activities before re-introduction into the workforce. Include other upper quadrant muscle deficiency, and correction of postural alignment and upper limb movements as clinically indicated.
**** Education: provide written information outlining the epicondylitis disease process, practical advice on self-management and ergonomics, and activity modification to avoid provocation of symptoms while remaining as active as possible.

SECTION 6.1.4.3

▸ SOFT TISSUE THERAPY

Soft tissue therapy is a mechanical therapy in which muscles, tendons, and ligaments are passively pressed or kneaded by hand or with mechanical devices. It includes relaxation massage, clinical massage, movement re-education and energy work.

Table 6.H: Soft Tissue Therapy for Persistent Epicondylitis

Recommendation 6.1.4.3.1	Offer muscle energy technique.* The program should include 5 repetitions (twice per week for 4 weeks) of resisted forearm pronation from an initial maximally supinated position to passively stretch the pronator muscles.
6.1.4.3.2	Offer myofascial release** to the forearm for a maximum of 12 sessions over 4 weeks.
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 10 – Appendix 4	

* Muscle energy technique is a soft tissue therapy performed by a health care professional that involves a stretch to the muscle after the muscle was contracted against resistance.
** Myofascial release is a hands-on technique that involves applying gentle sustained pressure into the myofascial connective tissue.

SECTION 6.1.4.4

PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 6.I: Passive Physical Modalities for Persistent Epicondylitis

Recommendation 6.1.4.4.1	Consider an elbow brace worn over the common extensor tendon during the daytime for 6 weeks (for lateral epicondylitis).
6.1.4.3.2	Do not offer transcutaneous electrical nerve stimulation (TENS).*
6.1.4.3.3	Do not add an elbow brace to multimodal physical therapy (for lateral epicondylitis).
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 6 – Appendix 4	

* Transcutaneous electrical nerve stimulation (TENS) is a passive physical modality connected to the skin, using two or more electrodes to apply low level electrical current. It is typically used with the intent to help pain management.

Soft tissue disorders of the shoulder managed using this guideline include grades I and II sprains or strains, tendinitis, bursitis and impingement syndrome affecting the gleno-humeral and acromio-clavicular joints.

Quick Reference Guide – Management of Shoulder Pain

Symptoms ≤ 3 months post-collision	Symptoms > 3 months post-collision
For all injured persons with shoulder pain: **Rule out** risk factors for serious pathologies[a] **Offer** information on nature, management, course of shoulder pain as a framework for initiation of a program of care **Conduct** ongoing assessment for symptom improvement or progression during intervention and refer accordingly **Discharge** injured person as appropriate at any point during intervention and recovery	
Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended: **Home and clinic based interventions:**[b,c] 1. Low-level laser therapy for short-term pain reduction 2. Spinal manipulation and mobilization as an adjunct to usual care for shoulder pain with associated pain or restricted movement of the cervico-thoracic spine 3. Multimodal care that includes the combination of: a) Heat/Cold b) Joint mobilization c) Range of motion exercise **Refer to specific recommendation for treatment details (Section 6.2.3)**	**Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:** **Home and clinic based interventions:**[b,c] 1. Low-level laser therapy for short-term pain reduction 2. Strengthening and stretching exercises 3. Usual GP care (information, recommendation, and pain contingent medical or pharmaceutical therapy) 4. Spinal manipulation and mobilization as an adjunct to usual care for shoulder pain with associated pain or restricted movement of the cervico-thoracic spine 5. Supervised combined strengthening and stretching exercises 6. Multimodal care that includes the combination of (if not previously given in 1st 3 months of care): a) Heat/Cold b) Joint mobilization c) Range of motion exercise **Refer to specific recommendation for treatment details (Section 6.2.4)**
Do Not Offer:[d] • Diacutaneous fibrolysis • Ultrasound • Interferential current therapy	**Do Not Offer:**[d] • Diacutaneous fibrolysis • Shock-wave therapy • Cervical mobilizations • Multimodal care that includes the combination of exercise, mobilization, taping, psychological interventions and massage • Ultrasound • Interferential current therapy
Outcome: **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Initiate persistent protocol **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician	**Outcome:** **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Refer to physician **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician

[a] Risk factors for serious pathologies (also known as red flags): Unexplained deformity or swelling or erythema of the skin; significant weakness not due to pain; past history of malignancy; suspected malignancy (e.g., weight loss or loss of appetite); fever/chills/malaise; significant unexplained sensory/motor deficits; pulmonary or vascular compromise; inability to perform any movements; pain at rest

[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness

[c] The ordering of interventions does not reflect superiority of effectiveness

[d] Based on evidence of no benefit to patients

The care pathway is presented in Figure 6.2

At initial contact, health care professionals should educate and reassure the patient that shoulder pain will resolve within a few months of symptoms onset. Patients greatly improve their recovery by actively participating in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first 3 months of care for shoulder pain is described below.

Assess the Patient with Shoulder Pain

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the shoulder pain care pathway.

Table 6.J Risk factors of serious pathology (red flags) for shoulder pain

Risk factors of serious pathology identified during history or physical examination*
• Unexplained deformity or swelling or erythema of the skin • Significant weakness not due to pain • Past history of malignancy • Suspected malignancy (e.g., weight loss or loss of appetite) • Fever/chills/malaise • Significant unexplained sensory/motor deficits • Pulmonary or vascular compromise • Inability to perform any movements • Pain at rest

Patients who also have neck pain and associated disorders or other injuries should be managed using the appropriate care pathways.

Patients with multiple injuries should be managed using all appropriate care pathways.

Educate and Reassure the Patient

A patient-centred care plan should be developed in partnership with the patient. It is important that the health

* This list of risk factors of serious pathology was informed by the following clinical practice guidelines: Hopman K, Krahe L, Lukersmith S, McColl AR, Vine K. Clinical practice guidelines for the management of rotator cuff syndrome in the workplace. Port Macquarie (Australia): University of New South Wales; 2013.
Washington State Department of Labor and Industries. Conservative care options for work-related mechanical shoulder conditions. Olympia (WA): Washington State Department of Labor and Industries; 2014 Apr 17.

care professional reassures and explains to patients that most individuals recover spontaneously from shoulder pain. Patients need to be reassured about the benign and self-limited nature of shoulder pain. Health care professionals also need to reassure patients if there are no major structural or progressive pathologies (e.g., dislocations, fractures or infection) in the shoulder. Risks and benefits of the care plan should be discussed with the patient.

Determine if Ongoing Clinical Care is Necessary

Health care professionals should first determine if the patient requires clinical care.

Deliver the Care Plan for Recent Onset Shoulder Pain (0-3 months post-collision)

Patients who require clinical care should be encouraged to actively participate in their care.

Health care professionals should discuss treatment options with their patients and, through a process of shared decision making, determine which therapeutic options they wish to pursue. Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:

- Low-level laser therapy for short-term pain reduction
- Spinal manipulation and mobilization as an adjunct to usual care for shoulder pain with associated pain or restricted movement of the cervico-thoracic spine
- Multimodal care that includes the combination of:
  i. Heat/Cold
  ii. Joint mobilization
  iii. Range of motion exercise

Interventions that are not recommended include:

- Diacutaneous fibrolysis
- Ultrasound
- Interferential current therapy

Discuss the risks and benefits of the care plan with the patient.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: “How well do you feel you are recovering from your injuries?” The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be ‘completely better’ or ‘much improved’ should be considered recovered*. Patients who have not

* The use of a valid and reliable condition-specific instrument (e.g. Disabilities of the Arm, Shoulder and Hand (DASH)) is encouraged but should not be used to measure overall recovery.

recovered should follow the care pathway outlined in this guideline.

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to a physician for further evaluation at any time point during their care.

Patients who have not significantly improved or recovered within the first 3 months after the injury should enter the care pathway for persistent shoulder pain described in section 6.2.2.

SECTION 6.2.2

CARE PATHWAY FOR PERSISTENT SHOULDER PAIN (4 - 6 MONTHS POST-COLLISION)

The care pathway is presented in Figure 6.2

Patients who still experience symptoms and disability more than 3 months after the injury may benefit from receiving additional clinical care. The primary goals of clinical care are to promote recovery by reducing symptoms and return patients to their normal activities of daily living.

Assess the Patient with Shoulder Pain

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the shoulder pain care pathway.

Patients who also have neck pain and associated disorders or other injuries should be managed using the appropriate care pathways.

Patients with multiple injuries should be managed using all appropriate care pathways.

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about shoulder pain and address any misunderstandings or apprehension through education and reassurance. The health care professional needs to educate and reassure the patient about the benign and self-limited nature of shoulder pain and reinforce the importance of maintaining activities of daily living.

Deliver the Care Plan for Persistent Shoulder Pain (4-6 months post-collision)

The goal of the care plan is to provide clinical interventions that promote resolution of symptoms and restoration of function. Patients requiring clinical care should be encouraged to participate in their program of care by remaining active.

Table 6.J Risk factors of serious pathology (red flags) for shoulder pain

Risk factors of serious pathology identified during history or physical examination*
• Unexplained deformity or swelling or erythema of the skin • Significant weakness not due to pain • Past history of malignancy • Suspected malignancy (e.g., weight loss or loss of appetite) • Fever/chills/malaise • Significant unexplained sensory/motor deficits • Pulmonary or vascular compromise • Inability to perform any movements • Pain at rest

Health care professionals should discuss treatment options with their patients and, through a process of shared decision making, determine which therapeutic options they wish to pursue. Based upon the shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:

- Low-level laser therapy for short-term pain reduction
- Strengthening and stretching exercises
- Usual GP care (information, recommendation, and pain contingent medical or pharmaceutical therapy)
- Spinal manipulation and mobilization as an adjunct to usual care for shoulder pain with associated pain or restricted movement of the cervico-thoracic spine
- Supervised combined strengthening and stretching exercises
- Multimodal care that includes the combination of (if not previously given in 1st 3 months of care):
  i. Heat/Cold
  ii. Joint mobilization
  iii. Range of motion exercise

Interventions that are not recommended include:

- Diacutaneous fibrolysis
- Shock-wave therapy
- Cervical mobilizations
- Multimodal care that includes the combination of exercise, mobilization, taping, psychological interventions and massage
- Ultrasound
- Interferential current therapy

Discuss the risks and benefits of the care plan with the patients.

* This list of risk factors of serious pathology was informed by the following clinical practice guidelines: Hopman K, Krahe L, Lukersmith S, McColl AR, Vine K. Clinical practice guidelines for the management of rotator cuff syndrome in the workplace. Port Macquarie (Australia): University of New South Wales; 2013.
Washington State Department of Labor and Industries. Conservative care options for work-related mechanical shoulder conditions. Olympia (WA): Washington State Department of Labor and Industries; 2014 Apr 17.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

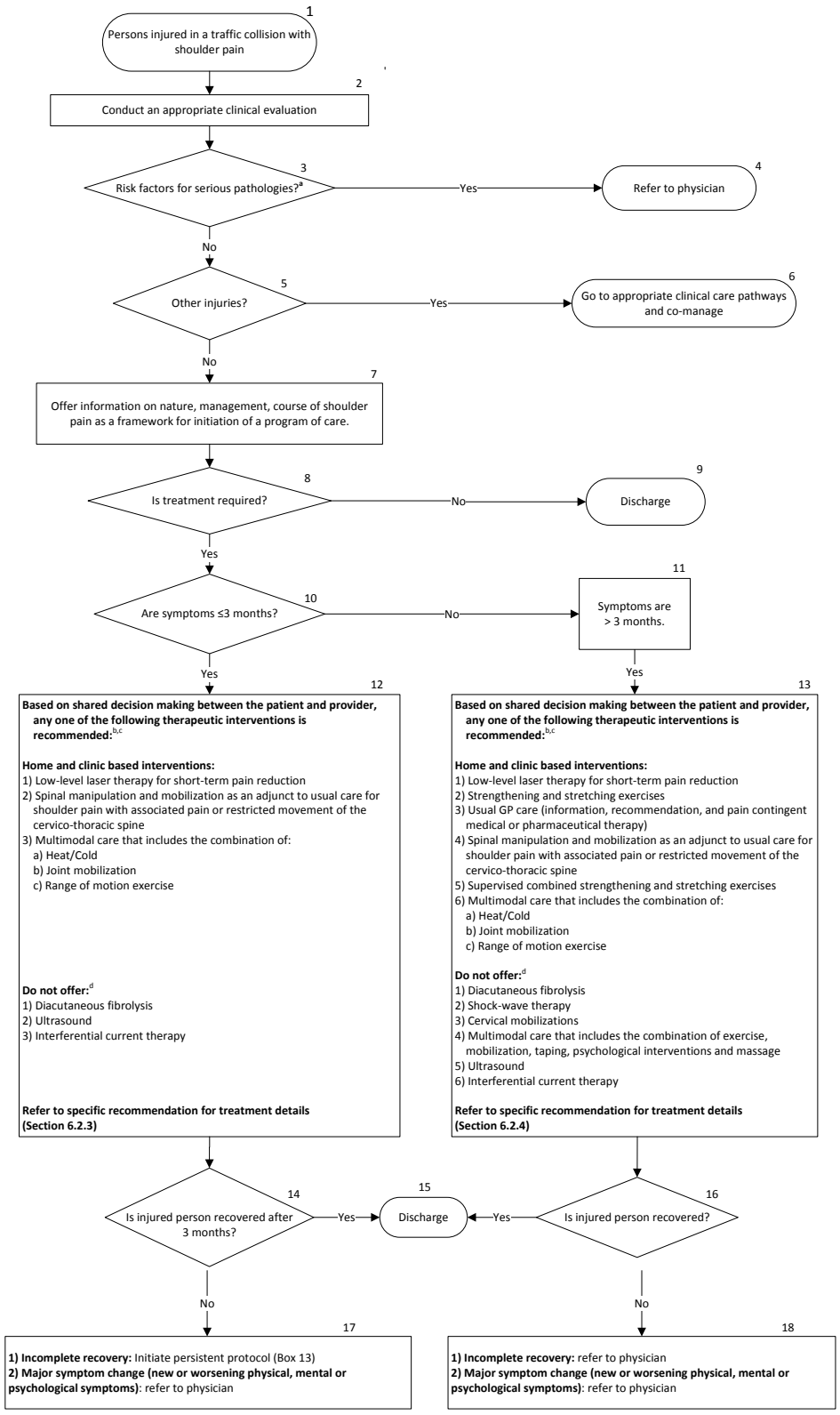
Patients should be discharged as soon as they have made significant improvement or recovered. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered.* Patients who have not recovered should follow the care pathway outlined in this guideline.

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to a physician for further evaluation at any time point during their care.

Patients who have not significantly improved or recovered should be referred to the physician for further evaluation.

* The use of a valid and reliable condition-specific instrument (e.g. Disabilities of the Arm, Shoulder and Hand (DASH)) is encouraged but should not be used to measure overall recovery.

Figure 6.2: Care Pathway for the Management of Shoulder Pain



[a] **Risk factors for serious pathologies (also known as red flags): Unexplained deformity or swelling or erythema of the skin; significant weakness not due to pain; past history of malignancy; suspected malignancy (e.g., weight loss or loss of appetite); fever/chills/malaise; significant unexplained sensory/ motor deficits; pulmonary or vascular compromise; inability to perform any movements; pain at rest**

[b] **This guideline does not include interventions for which there is a lack of evidence of effectiveness**

[c] **The ordering of interventions does not reflect superiority of effectiveness**

[d] **Based on evidence of no benefit to patients**

SECTION 6.2.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT SHOULDER PAIN

This section summarizes the key recommendations for the management of recent shoulder pain for the period extending from 0 to 3 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limiting nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver a time-limited program of care.
- Do not provide ineffective or experimental treatments.

SECTION 6.2.3.1

MULTIMODAL CARE

Multimodal care includes at least two distinct therapeutic modalities, provided by one or more health care disciplines.

Table 6.K: Multimodal Care for Recent Shoulder Pain

Recommendation 6.2.3.1.1	Consider multimodal care that includes heat*, cold*, joint mobilizations**, and range of motion exercises*** provided in 8-10 sessions over a maximum 5-6 weeks.
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 3 – Appendix 4	

* Twice weekly supervised application of hot packs and cold packs.
** Passive joint mobilization at the shoulder, sternoclavicular and acromioclavicular joints twice a week.
*** Daily home range of motion exercises entail progressively loaded functional movements of the arm, incorporating free weights or elastic resistance as required. Range of movement includes: shoulder abduction, flexion, extension, horizontal flexion and extension, hand-behind-back.

SECTION 6.2.3.2

SOFT TISSUE THERAPY

Soft tissue therapy is a mechanical therapy in which muscles, tendons, and ligaments are passively pressed or kneaded by hand or with mechanical devices. It includes relaxation massage, clinical massage, movement re-education and energy work.

Table 6.L: Soft Tissue Therapy for Recent Shoulder Pain

Recommendation 6.2.3.2.1	Do not offer diacutaneous fibrolysis.*
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 10 – Appendix 4	

* Diacutaneous fibrolysis is a non-invasive physiotherapeutic technique applied by means of a set of metallic hooks to release adherences between the different musculoskeletal structures.

SECTION 6.2.3.3

PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 6.M: Passive Physical Modalities for Recent Shoulder Pain

Recommendation 6.2.3.3.1	Offer low-level laser therapy (LLLT)* for short-term pain reduction (pulsed laser, 10 sessions over 2 weeks: 1) peak power = 1 kW, average power = 6 W, maximum energy of single impulse = 150 mJ, duration of single impulse <150 ms, fluency = 760 mJ/cm^2, wavelength = 1064 nm; or 2) wavelength = 890 nm, time = 2 minute/point, power 2-4 j/cm^2 in each point).
6.2.3.3.2	Do not offer ultrasound.**
6.2.3.3.3	Do not offer interferential current therapy.***
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 2 – Appendix 4	

* Low-level laser therapy is the application of a coherent light beam (laser) to a region for the purpose of reducing local pain or promoting local healing.
** Ultrasound is an oscillating sound pressure wave affecting structures beneath the skin surface.
*** Interferential current therapy produces current to selectively excite large diameter nerve fibres and temporarily inhibit transmission of nociceptive signals in the spinal dorsal horn from pain mediating small diameter nerve fibres.

SECTION 6.2.3.4

MANUAL THERAPY

Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization and traction.

Table 6.N: Manual Therapy for Recent Shoulder Pain

Recommendation 6.2.3.4.1	Consider spinal manipulation* and mobilization** as an adjunct to usual care for shoulder pain with associated pain or restricted movement of the cervico-thoracic spine, provided in 6 sessions over 12 weeks.
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 7 – Appendix 4	

* Manipulation are techniques incorporating a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion.
** Mobilization are techniques incorporating a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion.

SECTION 6.2.4

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT SHOULDER PAIN

This section summarizes the key recommendations for the management of persistent shoulder pain for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 6.2.4.1

EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common to the treatment and rehabilitation of shoulder pain.

Table 6.O: Exercise for Persistent Shoulder Pain

Recommendation 6.2.4.1.1	Offer strengthening and stretching exercises (home-based strengthening and stretching of the rotator cuff and scapulohumeral muscles, supervised weekly for 5 weeks).
6.2.4.1.2	Consider supervised combined strengthening and stretching exercises (8 repetitions of progressive shoulder flexion/extension/medial rotation/ lateral rotation strengthening, 2 sets, twice a week for 8 weeks; or home-based 5 repetitions of stretching of pectoralis minor and posterior shoulder per day, 10-20 repetitions of progressive strengthening for rotator cuff and serratus anterior, 3 sets per week for 8 weeks). *For low-grade non-specific shoulder pain
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 1 – Appendix 4	

* Low-grade pain: pain intensity <3/10 cm or 30/100 mm on Visual Analog Scale.

SECTION 6.2.4.2

MULTIMODAL CARE

Multimodal care includes at least two distinct therapeutic modalities, provided by one or more health care disciplines.

Table 6.P: Multimodal Care for Persistent Shoulder Pain

Recommendation 6.2.4.2.1	Consider usual GP care (information, recommendation, and pain contingent medical or pharmaceutical therapy).
6.2.4.2.2	Consider multimodal care that includes heat*, cold*, joint mobilizations**, and range of motion exercises*** provided in 8-10 sessions over a maximum of 5-6 weeks.
6.2.4.2.3	Do not offer multimodal care that includes exercise, mobilization, taping, psychological interventions, and massage.
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 3 – Appendix 4	

* Twice weekly supervised application of hot packs and cold packs.
** Passive joint mobilization at the shoulder, sternoclavicular and acromioclavicular joints twice a week.
*** Daily home range of motion exercises entail progressively loaded functional movements of the arm, incorporating free weights or elastic resistance as required. Range of movement includes: shoulder abduction, flexion, extension, horizontal flexion and extension, hand-behind-back.

SECTION 6.2.4.3

SOFT TISSUE THERAPY

Soft tissue therapy is a mechanical therapy in which muscles, tendons, and ligaments are passively pressed or kneaded by hand or with mechanical devices. It includes relaxation massage, clinical massage, movement re-education and energy work.

Table 6.Q: Soft Tissue Therapy for Persistent Shoulder Pain

Recommendation 6.2.4.3.1	Do not offer diacutaneous fibrolysis*
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 10 – Appendix 4	

* Diacutaneous fibrolysis is a non-invasive physiotherapeutic technique applied by means of a set of metallic hooks to release adherences between the different musculoskeletal structures.

SECTION 6.2.4.4

PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 6.R: Passive Physical Modalities for Persistent Shoulder Pain

Recommendation 6.2.4.4.1	Offer low-level laser therapy for short-term pain reduction* (pulsed laser, 10 sessions over 2 weeks: 1) peak power = 1 kW, average power = 6W, maximum energy of single impulse = 150mJ, duration of single impulse <150 ms, fluency = 760 mJ/cm^2, wavelength = 1064 nm; or 2), wavelength = 890 nm, time - 2 minute/point, power 2-4 j/cm^2 in each point). The long-term effectiveness of low-level laser therapy is unknown for sub-acromial impingement syndrome.
6.2.4.4.2	Do not offer shock-wave therapy.**
6.2.4.4.4	Do not offer ultrasound.***
6.2.4.4.4	Do not offer interferential current therapy.****
References: • Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 2 – Appendix 4	

* Low-level laser therapy is the application of a coherent light beam (laser) to a region for the purpose of reducing local pain or promoting local healing.
** Shock-wave therapy is a passive physical modality that is placed onto the skin with sustained pressure to send sound waves into areas of soft tissue.
*** Ultrasound is an oscillating sound pressure wave affecting structures beneath the skin surface.
**** Interferential current therapy produces current to selectively excite large diameter nerve fibres and temporarily inhibit transmission of nociceptive signals in the spinal dorsal horn form pain mediating small diameter nerve fibres.

SECTION 6.2.4.5

MANUAL THERAPY

Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization and traction.

Table 6.S: Manual Therapy for Persistent Shoulder Pain

Recommendation 6.2.4.5.1	Consider spinal manipulation* and mobilization** as an adjunct to usual care for shoulder pain with associated pain or restricted movement of the cervico-thoracic spine provided in 6 sessions over 12 weeks.
6.2.4.5.2	Do not offer cervical mobilizations.*

References:

- Decision Determinants and Evidence Table for Upper Extremity Injuries – Report 7 – Appendix 4

* Manipulation are techniques incorporating a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion.
** Mobilizations are techniques incorporating a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion.

SECTION 6.3

MANAGEMENT OF SHOULDER PAIN WITH CALCIFIC TENDINITIS

Quick Reference Guide – Management of shoulder pain with calcific tendinitis

Management of Calcific Tendinitis

For all injured persons with shoulder pain with calcific tendinitis:
Rule out risk factors for serious pathologies[a]
Offer information on nature, management, course of shoulder pain with calcific tendinitis as a framework for initiation of a program of care
Conduct ongoing assessment for symptom improvement or progression during intervention and refer accordingly
Discharge injured person as appropriate at any point during intervention and recovery

Based upon shared decision making between the patient and provider, the following therapeutic intervention is recommended:[b]

1. Shock-wave therapy with an amplitude ranging from 0.08mJ/mm^2-0.6mJ/mm^2

Refer to specific recommendation for treatment details (Section 6.3.2)

Outcome:
Recovered → **Discharge**
Unrecovered: **Incomplete recovery** → Refer to physician
Major symptom change (new or worsening physical, mental or psychological symptoms) → Refer to physician

[a] Risk factors for serious pathologies (also known as red flags): Unexplained deformity or swelling or erythema of the skin; significant weakness not due to pain; past history of malignancy; suspected malignancy (e.g., weight loss or loss of appetite); fever/chills/malaise; significant unexplained sensory/motor deficits; pulmonary or vascular compromise; inability to perform any movements; pain at rest
[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness

The care pathway is presented in Figure 6.3

The primary goals of clinical care are to promote recovery by reducing symptoms and return patients to their normal activities of daily living.

Assess the Patient with Shoulder Pain with Calcific Tendinitis

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the shoulder pain with calcific tendinitis care pathway.

Patients who also have neck pain and associated disorders or other injuries should be managed using the appropriate care pathways.

Table 6.J Risk factors of serious pathology (red flags) for shoulder pain

Risk factors of serious pathology identified during history or physical examination*
• Unexplained deformity or swelling or erythema of the skin • Significant weakness not due to pain • Past history of malignancy • Suspected malignancy (e.g., weight loss or loss of appetite) • Fever/chills/malaise • Significant unexplained sensory/motor deficits • Pulmonary or vascular compromise • Inability to perform any movements • Pain at rest

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about shoulder pain with calcific tendinitis and address any misunderstandings or apprehension through education and reassurance. The health care professional needs to educate and reassure the patient about the benign and self-limited nature of shoulder pain with calcific tendinitis and reinforce the importance of maintaining activities of daily living.

* This list of risk factors of serious pathology was informed by the following clinical practice guidelines: Hopman K, Krahe L, Lukersmith S, McColl AR, Vine K. Clinical practice guidelines for the management of rotator cuff syndrome in the workplace. Port Macquarie (Australia): University of New South Wales; 2013.
Washington State Department of Labor and Industries. Conservative care options for work-related mechanical shoulder conditions. Olympia (WA): Washington State Department of Labor and Industries; 2014 Apr 17.

Deliver the Care Plan for Persistent Shoulder Pain with Calcific Tendinitis (4-6 months post-collision)

The goal of the care plan is to provide clinical interventions that promote resolution of symptoms and restoration of function. Patients requiring clinical care should be encouraged to participate in their program of care by remaining active.

Health care professionals should discuss the treatment plan with their patients, emphasizing the risk and benefits of the care plan. Based upon shared decision making between the patient and provider, the following therapeutic intervention is recommended:

- Shock-wave therapy with an amplitude ranging from 0.08mJ/mm^2-0.6mJ/mm^2

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

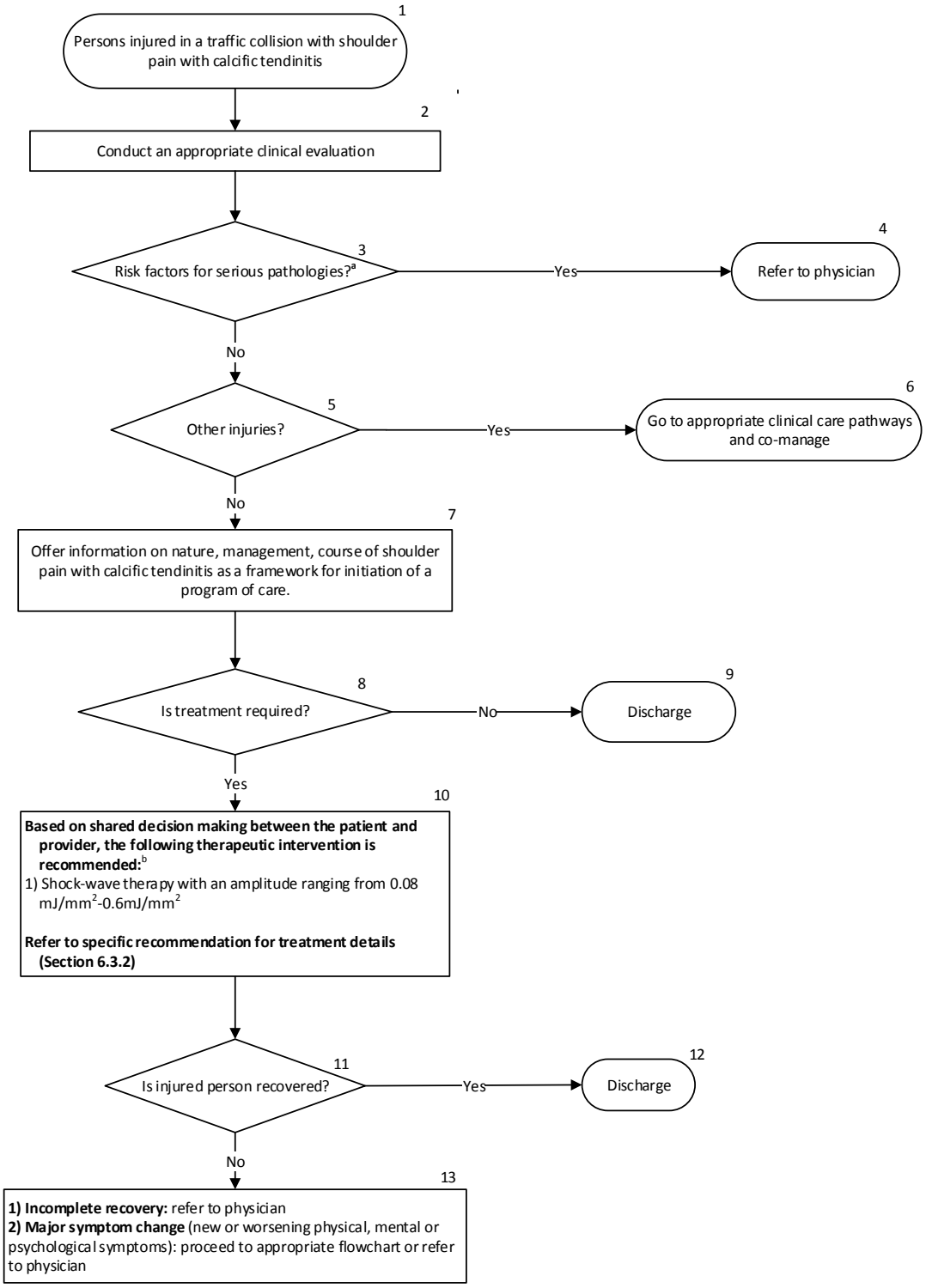
Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: “How well do you feel you are recovering from your injuries?” The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be ‘completely better’ or ‘much improved’ should be considered recovered.* Patients who have not recovered should follow the care pathway outlined in this guideline.

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms (other than shoulder pain with calcific tendinitis) should be referred to a physician for further evaluation at any time point during their care.

Patients who have not improved significantly or recovered should be referred to the physician for further evaluation.

* The use of a valid and reliable condition-specific instrument (e.g. Disabilities of the Arm, Shoulder and Hand (DASH)) is encouraged but should not be used to measure overall recovery.

Figure 6.3: Care Pathway for the Management of Shoulder Pain with Calcific Tendinitis



[a] **Risk factors for serious pathologies (also known as red flags): Unexplained deformity or swelling or erythema of the skin; significant weakness not due to pain; past history of malignancy; suspected malignancy (e.g., weight loss or loss of appetite); fever/chills/malaise; significant unexplained sensory/ motor deficits; pulmonary or vascular compromise; inability to perform any movements; pain at rest**

[b] **This guideline does not include interventions for which there is a lack of evidence of effectiveness**

SECTION 6.3.2

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF SHOULDER PAIN WITH CALCIFIC TENDINITIS

This section summarizes the key recommendations for the management of shoulder pain with calcific tendinitis. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 6.3.2.1

PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 6.T: Passive Physical Modalities for Shoulder Pain with Calcific Tendinitis

Recommendation 6.3.2.1.1	Offer shock-wave therapy* with an amplitude ranging from 0.08mJ/mm^2-0.6mJ/mm^2 (a maximum of 4 sessions over 4 weeks).
References: • Decision Determinants and Evidence Table or Upper Extremity Injuries – Report 2 – Appendix 4	

* Shock-wave therapy is a passive physical modality that is placed onto the skin with sustained pressure to send sound waves into areas of soft tissue.

SECTION 7.0

GUIDELINE FOR THE CLINICAL MANAGEMENT OF LOWER EXTREMITY SOFT TISSUE DISORDERS

This evidence-based guideline establishes the best practice for the clinical management of lower extremity disorders caused or exacerbated by a motor vehicle collision. This guideline covers recent onset (0-3 months post-collision) and persistent (4-6 months post-collision) patellofemoral pain, ankle sprain, Achilles tendinopathy, plantar fasciitis and plantar heel pain; it does not cover disorders that persist for more than 6 months post-collision.

Lower extremity soft tissue disorders refer to grade I and II sprains or strains, tendonitis, tendinopathy, tendinosis, patellofemoral pain (syndrome), and non-specific pain of the hip, thigh, knee, leg, ankle and foot. Strains and sprains can be classified into three grades, distinguished by the severity of signs and symptoms and structural disruption (Table 7.A and Table 7.B). This guideline is not indicated for conditions that include the presence of major structural or other pathological causes of lower extremity disorders such as fractures, dislocations, osteoarthritis, inflammatory disorders, systemic disease, infections, tumors and Grade III sprains/strains. However, studies of ankle injuries that included Grade I-III sprains/strains were reviewed when the evidence was stratified by injury severity.

Table 7.A. The American Academy of Orthopaedic Surgeons Classification of Sprains

Grade	Definition
I	Ligamentous fibres are stretched but remain structurally intact
II	Ligamentous fibres become partially torn and physical stress reveals increased laxity with a definite end point
III	A ligament is completely torn, leading to gross instability

Table 7.B. The American Academy of Orthopaedic Surgeons Classification of Strains

Grade	Definition
I	Less than 5% of muscle/tendon fibres are disrupted, with fascia remaining intact
II	Muscle fibre/tendon discontinuity involves a moderate number of muscle fibres.
III	There is complete discontinuity in the muscle fibres

Lower extremity pain following a motor vehicle collision is common. In a Canadian population-based cohort, 42% of injured adults reported buttock pain, 28% reported lower extremity pain, and 2% reported groin pain within 30 days after a motor vehicle collision*.

The clinical management recommended in this guideline aims to: 1) accelerate recovery; 2) reduce the intensity of symptoms; 3) promote early restoration of function; 4) prevent chronic pain and disability; 5) improve health-related quality of life; 6) reduce recurrences; and 7) promote active participation of patients in their care.

Patients with multiple injuries should be managed using all appropriate care pathways. For example, patients with lower extremity soft tissue disorders commonly suffer from neck pain. Patients with lower extremity soft tissue disorders and neck pain and its associated disorders (NAD) should also receive care as recommended in the NAD care pathways described in Chapter 4.

Patient-centered care is an internationally recognized principle that was fundamental to the development of this guideline. This guideline reinforces the importance of communication and partnership between patients and health care professionals.

All recommendations included in this guideline are based on studies with low risk of bias.

Interventions not described in this guideline are not recommended for the management of patients with lower extremity soft tissue disorders because of a lack of evidence about their effectiveness and safety.

* Hincapié C, Cassidy JD, Côté P, Carroll LJ, Guzmán J. Whiplash injury is more than neck pain: a population-based study of pain localization after traffic injury. JOEM. 2010; 52:434-440.

Health care professionals eligible to provide care under this guideline are those defined by the Statutory Accident Benefits Schedule (SABS).

This guideline is organized in four sections. Each section provides evidence-based recommendations for the clinical management of various types and durations of lower extremity soft tissue disorders:

- Section 7.1 - Management of patellofemoral pain
- Section 7.2 - Management of ankle sprain
- Section 7.3 - Management of Achilles tendinopathy
- Section 7.4 - Management of plantar fasciitis and heel pain

All recommendations presented in this guideline integrate the:

- Key decision determinants based upon the framework developed by the Ontario Health Technology Advisory Committee (OHTAC);
- Best evidence obtained from a critical review of current scientific literature; and
- Qualitative research exploring the experiences of persons treated for traffic injuries in Ontario

All background documents and references are available at http://www.fsco.gov.on.ca

SECTION 7.1

MANAGEMENT OF PATELLOFEMORAL PAIN

Quick Reference Guide – Management of Patellofemoral Pain

Symptoms ≤ 3 months post-collision	Symptoms > 3 months post-collision
For all injured persons with patellofemoral pain: **Rule out** risk factors for serious pathologies[a] **Offer** information on nature, management, course of collision-related patellofemoral pain as a framework for initiation of a program of care **Conduct** ongoing assessment for symptom improvement or progression during intervention and refer accordingly **Discharge** injured person as appropriate at any point during intervention and recovery	
1. Monitor and reassure **Refer to specific recommendation for treatment details (Section 7.1.3)**	**Based upon shared decision making between the patient and provider, the following therapeutic intervention is recommended:**[b] 1. Supervised clinic-based combined exercise **Refer to specific recommendation for treatment details (Section 7.1.4)**
Outcome: **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Initiate persistent protocol **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician	**Outcome:** **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Refer to physician **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician

[a] Risk factors for serious pathologies (also known as red flags): history of major trauma; minor trauma (if >50 years, history of osteoporosis and taking corticosteroids); erythema, warmth, effusion and decreased range of motion; high velocity injury, absent pulses, foot drop, multiple plane laxity; past history of malignancy, unexplained weight loss, pain at multiple sites, night pain, pain at rest

[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness

SECTION 7.1.1

CARE PATHWAY FOR RECENT ONSET PATELLOFEMORAL PAIN (0 - 3 MONTHS POST-COLLISION)

The care pathway is presented in Figure 7.1.

At initial contact, health care professionals should educate and reassure the patient that patellofemoral pain will resolve within weeks to months of symptom onset. Patients greatly improve their recovery by actively participating in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first 3 months of care for patellofemoral pain is described below.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the patellofemoral pain care pathway.

Table 7.C Risk factors of serious pathology (red flags) for patellofemoral pain

Risk factors of serious pathology identified during history or physical examination*
• History of major trauma • Minor trauma (if >50 years, history of osteoporosis and taking corticosteroids) • Erythema, warmth, effusion and decreased range of motion • High velocity injury, absent pulses, foot drop, multiple plane laxity • Past history of malignancy, unexplained weight loss, pain at multiple sites, night pain, pain at rest

Patients with multiple injuries should be managed using the appropriate care pathways.

Monitor and Reassure the Patient

Patients with recent onset patellofemoral pain syndrome resulting from a traffic collision suffer from a minor trauma to the knee. Patients need to be reassured about the benign and self-limited nature of patellofemoral pain. Health care professionals also need to reassure patients if there are no major structural or progressive pathologies (e.g., dislocations, fractures or infection) in their knee. Clinicians should monitor the progression of patellofemoral pain syndrome and ensure that patients are effectively coping with their symptoms.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered.[+]

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who have not significantly improved or recovered within the first 3 months after the injury should enter the care pathway for persistent patellofemoral pain described in section 7.1.2.

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* This list of risk factors of serious pathology was informed by the following clinical practice guidelines:
Australian Acute Musculoskeletal Pain Guidelines Group. Evidence-based management of Acute Musculoskeletal Pain. A Guide for Clinicians. Queensland, Australia: Australian Academic Press; 2004.
New Zealand Guidelines Group. The Diagnosis and Management of Soft Tissue Knee Injuries: Internal Derangements. Best Practice Evidence-Based Guideline. Available from: http://www.health.govt.nz/system/files/documents/publications/acc_soft_tissue_knee_injury_fulltext.pdf
Bennett DL, Nelson JW, Weissman BN, Kransdorf MJ, Appel M, Bencardino JT, Fries IB, Hayes CW, Hochman MG, Jacobson JA, Luchs JS, Math KR, Murphey MD, Newman JS, Rubin DA, Scharf SC, Small KM, Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria® nontraumatic knee pain. http://www.guideline.gov/content.aspx?id=43872 [online publication]. Reston (VA): American College of Radiology (ACR); 2012.
[+] The use of a valid and reliable condition-specific instrument [e.g., Anterior Knee Pain Scale (AKPS)] is encouraged but should not be used to measure overall recovery.

The care pathway is presented in Figure 7.1.

Patients who still experience symptoms and disability more than 3 months after the injury may benefit from receiving additional clinical care. The primary goals of clinical care are to promote recovery by reducing symptoms and return patients to their normal activities of daily living.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once a pathology has been ruled out, the patient should be treated according to the patellofemoral pain care pathway.

Table 7.C Risk factors of serious pathology (red flags) for patellofemoral pain

Risk factors of serious pathology identified during history or physical examination*
• History of major trauma • Minor trauma (if >50 years, history of osteoporosis and taking corticosteroids) • Erythema, warmth, effusion and decreased range of motion • High velocity injury, absent pulses, foot drop, multiple plane laxity • Past history of malignancy, unexplained weight loss, pain at multiple sites, night pain, pain at rest

Patients with multiple injuries should be managed using the appropriate care pathways.

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about patellofemoral pain and address any misunderstandings or apprehension through education and reassurance. The health care professional needs to educate and reassure the patient about the benign and self-limited nature of patellofemoral pain and reinforce the importance of maintaining activities of daily living.

* This list of risk factors of serious pathology was informed by the following clinical practice guidelines:
Australian Acute Musculoskeletal Pain Guidelines Group. Evidence-based management of Acute Musculoskeletal Pain. A Guide for Clinicians. Queensland, Australia: Australian Academic Press; 2004.
New Zealand Guidelines Group. The Diagnosis and Management of Soft Tissue Knee Injuries: Internal Derangements. Best Practice Evidence-Based Guideline. Available from: http://www.health.govt.nz/system/files/documents/publications/acc_soft_tissue_knee_injury_fulltext.pdf
Bennett DL, Nelson JW, Weissman BN, Kransdorf MJ, Appel M, Bencardino JT, Fries IB, Hayes CW, Hochman MG, Jacobson JA, Luchs JS, Math KR, Murphey MD, Newman JS, Rubin DA, Scharf SC, Small KM, Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria® nontraumatic knee pain. http://www.guideline.gov/content.aspx?id=43872 [online publication]. Reston (VA): American College of Radiology (ACR); 2012.

Deliver the Care Plan for Persistent Patellofemoral Pain (4-6 months post-collision)

The goal of the care plan is to provide clinical interventions that promote resolution of symptoms and restoration of function. Patients requiring clinical care should be encouraged to participate in their program of care by remaining active. Health care professionals should discuss the treatment plan with their patients, emphasizing the risks and benefits of the care plan. Based on shared decision making between the patient and provider, the following therapeutic intervention is recommended:

- Supervised clinic-based combined exercise

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

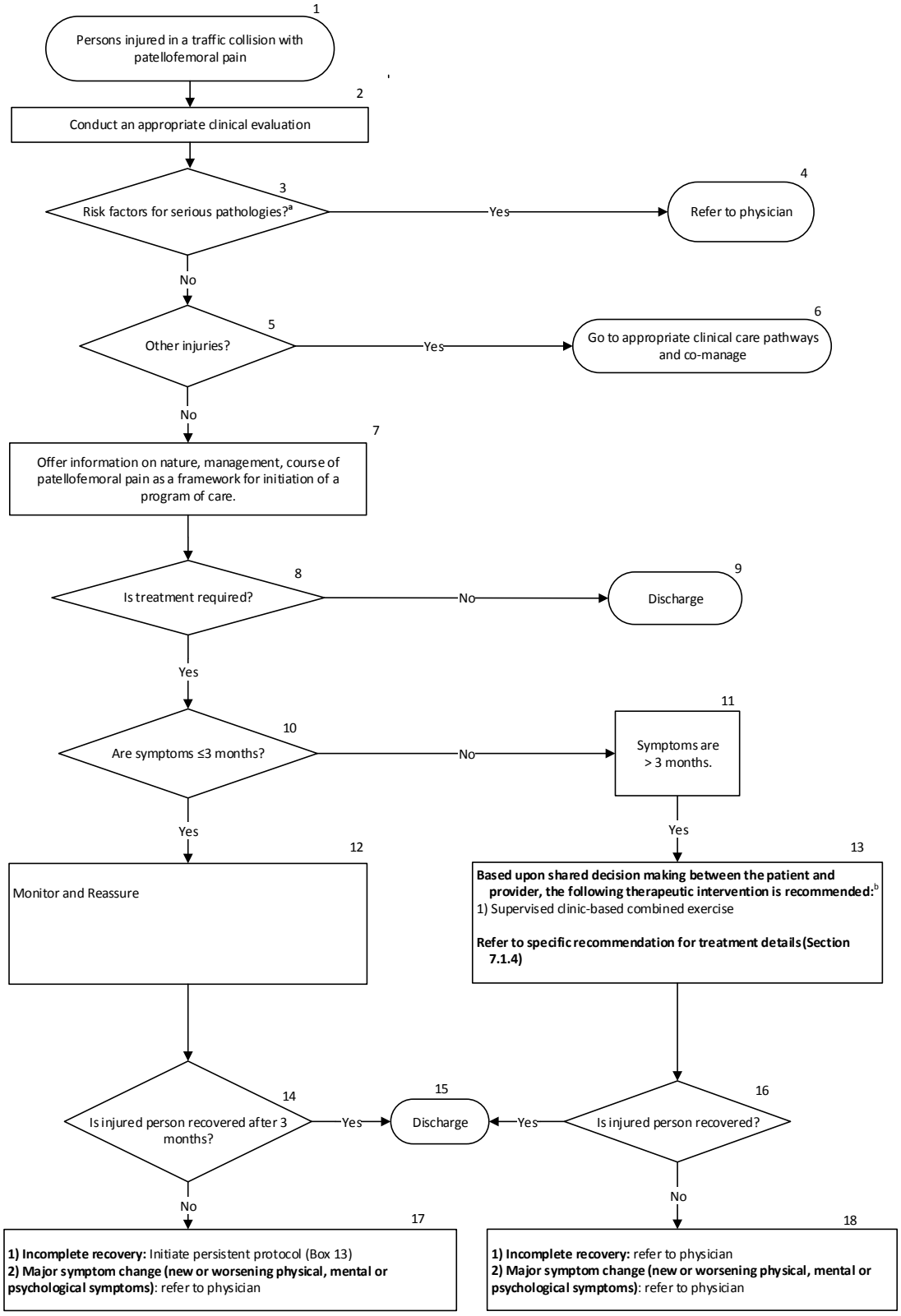
Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: “How well do you feel you are recovering from your injuries?” The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be ‘completely better’ or ‘much improved’ should be considered recovered*.

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who have not improved significantly or recovered should be referred to their physician for further evaluation.

* The use of a valid and reliable condition-specific instrument [e.g., Anterior Knee Pain Scale (AKPS)] is encouraged but should not be used to measure overall recovery.

Figure 7.1: Care Pathway for the Management of Patellofemoral Pain



[a] **Risk factors for serious pathologies (also known as red flags):History of major trauma; minor trauma (if >50 years, history of osteoporosis and taking corticosteroids); erythema, warmth, effusion and decreased range of motion; high velocity injury, absent pulses, foot drop, multiple plane laxity; past history of malignancy, unexplained weight loss, pain at multiple sites, night pain, pain at rest**

[b] **This guideline does not include interventions for which there is a lack of evidence of effectiveness**

SECTION 7.1.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT ONSET PATELLOFEMORAL PAIN

Most individuals with patellofemoral pain recover from their injury. However, it is recommended that the following be performed as a component of standard clinical care.

- Monitor the symptoms.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the nature of their pain.
- Encourage patients to maintain their activities of daily living.
- Do not provide ineffective or experimental treatments.

SECTION 7.1.4

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT PATELLOFEMORAL PAIN

This section summarizes the key recommendations for the management of persistent patellofemoral pain for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 7.1.4.1

▸ EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common to the treatment and rehabilitation of knee pain.

Table 7.D: Exercise for persistent patellofemoral pain

Recommendation 7.1.4.1.1	Consider supervised clinic-based combined exercise (25 minutes of progressive loaded exercise for the quadriceps, adductor and gluteal muscles, 9 visits over 6 weeks; 25 minutes of home exercise daily for 3 months).
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 1 - Appendix 5	

Quick Reference Guide – Management of Ankle Sprain

Symptoms ≤ 3 months post-collision	Symptoms > 3 months post-collision
For all injured persons with ankle sprain: **Rule out** risk factors for serious pathologies[a] **Offer** information on nature, management, course of collision-related ankle sprain as a framework for initiation of a program of care **Conduct** ongoing assessment for symptom improvement or progression during intervention and refer accordingly **Discharge** injured person as appropriate at any point during intervention and recovery	
Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended: **Home and clinic-based interventions:**[b,c] 1. Initiate a home exercise program within one week post-collision based on patient preference 2. For grades I/II ankle sprains: Home-based cryotherapy 3. For grades II/III ankle sprains: Semi-rigid brace, semi-rigid boot or below-knee immobilization walking cast 4. Mobilization of the distal and proximal tibiofibular joints, talocrural, and subtalar joints **Refer to specific recommendation for treatment details (Section 7.2.3)**	**Based upon shared decision making between the patient and provider, the following therapeutic intervention is recommended:** [b] 1. Mobilization of the distal and proximal tibiofibular joints, talocrural, and subtalar joints **Refer to specific recommendation for treatment details (Section 7.2.4)**
Do Not Offer: [d] • Supervised progressive exercise program • Low-level laser therapy (includes high- or low-dose laser which stimulates tissue and alters its function)	
Outcome: **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Initiate persistent protocol **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician	**Outcome:** **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Refer to physician **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician

[a] Risk factors for serious pathologies (also known as red flags): positive Ottawa Ankle Rules; children <12 years of age, elderly patients; erythema, warmth; fever, chills, prolonged pain, swelling, catching and/or instability of the ankle joint; pain at rest, awakening due to pain at night, bilateral pain
[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness
[c] The ordering of interventions does not reflect superiority of effectiveness
[d] Based on evidence of no benefit to patients

SECTION 7.2.1

CARE PATHWAY FOR RECENT ONSET ANKLE SPRAIN (0 - 3 MONTHS POST-COLLISION)

The care pathway is presented in Figure 7.2.

At initial contact, health care professionals should educate and reassure the patient that most ankle sprains resolve within a few months of symptom onset. Patients greatly improve their recovery by actively participating in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first three months of care for ankle sprains is described below.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. Fractures can be ruled out using the Ottawa Ankle Rules (Appendix 7.A). The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further

investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the ankle sprain care pathway.

Patients with multiple injuries should be managed using the appropriate care pathways.

Educate and Reassure the Patient

A patient-centred care plan should be developed in partnership with the patient. It is important that the health care professional reassures and explains to patients that most individuals recover from an ankle sprain. Patients need to be reassured about the benign and self-limited nature of ankle sprains. Health care professionals also need to reassure patients if there are no major structural or progressive pathologies (e.g., fractures or infection) in the ankle.

Determine if Ongoing Clinical Care is Necessary

Health care professionals should first determine if the patient requires clinical care.

Deliver the Care Plan for recent onset ankle sprain (0-3 months post-collision)

Patients who require clinical care should be encouraged to actively participate in their care by staying active.

Health care professionals should discuss treatment options with their patients and, through a process of shared decision making, determine which therapeutic options they wish to pursue. Based upon shared decision making between the patient and provider, any one of the following therapeutic intervention is recommended:

- Home exercise program initiated within the first week post-collision
- Home-based cryotherapy for grades I/II ankle sprains
- Semi-rigid brace, semi-rigid boot or below-knee immobilization walking cast for grades II/III ankle sprains
- Mobilization of the distal and proximal tibiofibular joints, talocrural, and subtalar joints

Interventions that are not recommended include:

- Supervised progressive exercise program
- Low-level laser therapy

Discuss the risks and benefits of the care plan with the patient.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: “How well do you feel you are recovering from your injuries?” The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients

reporting to be 'completely better' or 'much improved' should be considered recovered.*

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who have not significantly improved or recovered within the first 3 months after the injury should enter the care pathway for persistent ankle sprain described in section 7.2.2.

Table 7.E Risk factors of serious pathology (red flags) for ankle sprain

Risk factors of serious pathology identified during history or physical examination[+]
• Positive Ottawa Ankle Rules • Children <12 years of age; Elderly patients • Erythema, warmth • Fever, chills • Prolonged pain, swelling, catching and/or instability of the ankle joint • Pain at rest, awakening due to pain at night, bilateral pain

* The use of a valid and reliable condition-specific instrument e.g., Lower Extremity Functional Scale (LEFS) is encouraged but should not be used to measure overall recovery.

[+] This list of risk factors of serious pathology was informed by the following text and clinical practice guidelines:

Royal Dutch Society of Physical Therapy (KNGF). KNGF—Guideline for Physical Therapy in patients with acute ankle sprain. Supplement to the Dutch Journal of Physical Therapy. 116 (5); 2006.

New Zealand Guidelines Group. Chiropractic Treatment Profiles 2003. Available from: http://www.acc.co.nz/PRD_EXT_CSMP/groups/external_providers/documents/guide/dis_ctrb093423.pdf

Hoffman MR, Daniels JM (Eds.). Common Musculoskeletal Problems: A Handbook. London: Springer; 2010.

The care pathway is presented in Figure 7.2.

Patients who still experience symptoms and disability more than 3 months after the injury may benefit from receiving additional clinical care. The primary goals of clinical care are to promote recovery by reducing symptoms and return patients to their normal activities of daily living.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. Fractures can be ruled out using the Ottawa Ankle Rules (Appendix 7.A). The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once a pathology has been ruled out, the patient should be treated according to the ankle sprain clinical pathway.

Table 7.E Risk factors of serious pathology (red flags) for ankle sprain

Risk factors of serious pathology identified during history or physical examination*
• Positive Ottawa Ankle Rules • Children <12 years of age; Elderly patients • Erythema, warmth • Fever, chills • Prolonged pain, swelling, catching and/or instability of the ankle joint • Pain at rest, awakening due to pain at night, bilateral pain

Patients with multiple injuries should be managed using the appropriate care pathways.

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about an ankle sprain and address any misunderstandings or apprehension through education and reassurance. The health care professional needs to educate and reassure the patient about the benign and self-limited nature of an ankle sprain and reinforce the importance of maintaining activities of daily living.

Deliver the Care Plan for Persistent Ankle Sprain (4-6 months post-collision)

The goal of the care plan is to provide clinical interventions that promote resolution of symptoms and restoration

* This list of risk factors of serious pathology was informed by the following text and clinical practice guidelines:
Royal Dutch Society of Physical Therapy (KNGF). KNGF—Guideline for Physical Therapy in patients with acute ankle sprain. Supplement to the Dutch Journal of Physical Therapy. 116 (5); 2006.
New Zealand Guidelines Group. Chiropractic Treatment Profiles 2003. Available from: http://www.acc.co.nz/PRD_EXT_CSMP/groups/external_providers/documents/guide/dis_ctrb093423.pdf
Hoffman MR, Daniels JM (Eds.). Common Musculoskeletal Problems: A Handbook. London: Springer; 2010.

of function. Patients requiring clinical care should be encouraged to participate in their program of care by remaining active.

Health care professionals should discuss the treatment plan with their patients, emphasizing the risks and benefits of the care plan.

Based upon shared decision making between the patient and provider, the following therapeutic intervention is recommended:

- Mobilization of the distal and proximal tibiofibular joints, talocrural, and subtalar joints.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

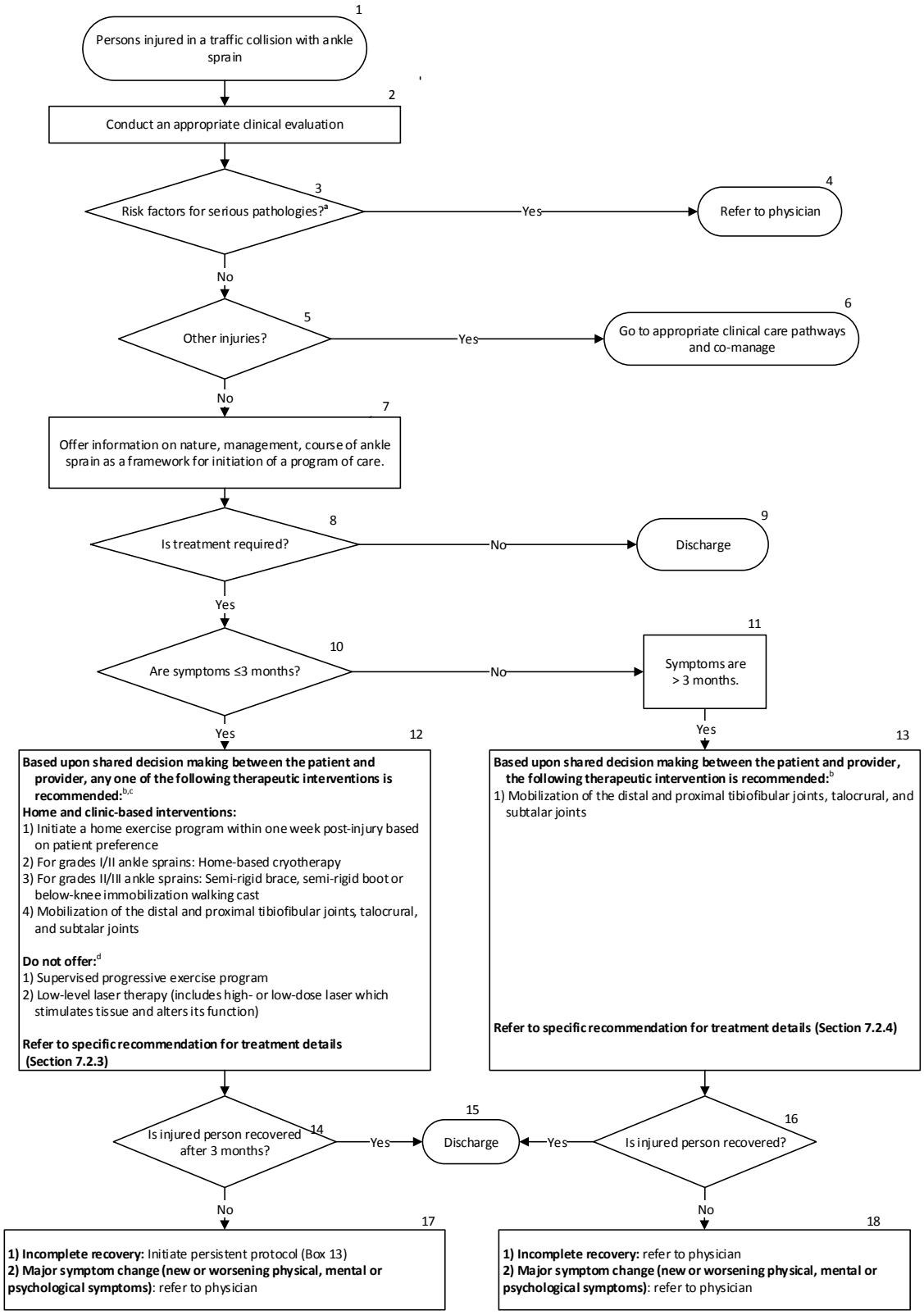
Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: “How well do you feel you are recovering from your injuries?” The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be ‘completely better’ or ‘much improved’ should be considered recovered.*

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who have not improved significantly or recovered should be referred to their physician for further evaluation.

* The use of a valid and reliable condition-specific instrument [e.g., Lower Extremity Functional Scale (LEFS)] is encouraged but should not be used to measure overall recovery.

Figure 7.2: Care Pathway for the Management of Ankle Sprain



[a] Risk factors for serious pathologies (also known as red flags): Positive Ottawa Ankle Rules; children <12 years of age, elderly patients; erythema, warmth; fever, chills; prolonged pain, swelling, catching and/or instability of the ankle joint; pain at rest, awakening due to pain at night, bilateral pain
[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness
[c] The ordering of interventions does not reflect superiority of effectiveness
[d] Based on evidence of no benefit to patients

SECTION 7.2.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT ONSET ANKLE SPRAIN

This section summarizes the key recommendations for the management of recent ankle sprain for the period extending from 0 to 3 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limiting nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 7.2.3.1

EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common to the treatment and rehabilitation of ankle pain.

Table 7.F: Exercise for recent ankle sprain

Recommendation 7.2.3.1.1	Consider initiating a home exercise program within one week post-collision based on patient tolerance. The program should include therapeutic exercises with cryotherapy adapted from a standard protocol that includes: active circumduction mobility (20 repetitions), active plantar flexion/dorsiflexion mobility (20 repetitions); static muscle strengthening: eversion, inversion, plantar flexion, dorsiflexion (5 repetitions each); functional movement pattern (lower limb triple flexion/extension; 30 repetitions); and triceps surae stretch (3 repetitions) 4 times per week for 4 weeks.
7.2.3.1.2	Do not offer a supervised progressive exercise program.
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 1 - Appendix 5	

SECTION 7.2.3.2

PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 7.G: Passive physical modalities for recent ankle sprain

Recommendation 7.2.3.2.1	For grades I/II ankle sprains, consider home-based cryotherapy. The program should include standard application of 20 minutes of continuous ice treatment performed every two hours; or, ice applied for 10 minutes, the ankle is rested at room temperature for 7 minutes, ice is reapplied for 10 minutes and performed every two hours; over the first 72 hours.
7.2.3.2.2	For grades II/III ankle sprains, consider semi-rigid brace during the daytime (4 weeks), semi-rigid boot during the daytime (4 weeks) or below-knee immobilization walking cast (10 days).
7.2.3.2.3	Do not offer low-level laser therapy.*
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 5 - Appendix 5	

* Low-level laser therapy is the application of a coherent light beam (laser) to a region for the purpose of reducing local pain or promoting local healing.

SECTION 7.2.3.3

MANUAL THERAPY

Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization and traction.

Table 7.H: Manual therapy for recent ankle sprain

Recommendation 7.2.3.3.1	Consider mobilization of the distal and proximal tibiofibular joints, talocrural, and subtalar joints.* The program should include 5 repetitions (30 seconds; grades I-IV mobilization at the therapist's discretion), twice per week for 4 weeks.
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 3 - Appendix 5	

* Mobilizations are techniques incorporating a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion.

SECTION 7.2.4

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT ANKLE SPRAIN

This section summarizes the key recommendations for the management of persistent ankle sprain for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 7.2.4.1

MANUAL THERAPY

Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization and traction.

Table 7.I: Manual therapy for persistent ankle sprain

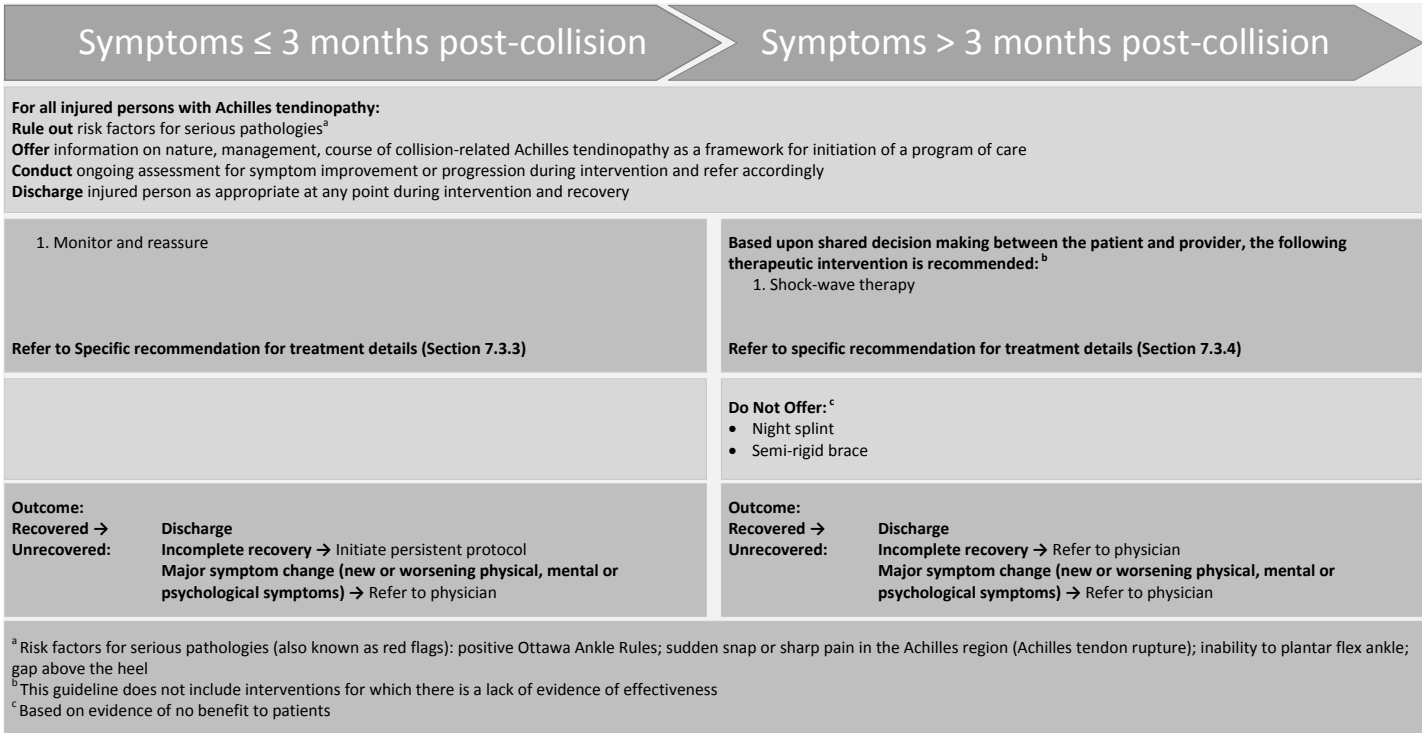
Recommendation 7.2.4.1.1	Consider mobilization of the distal and proximal tibiofibular joints, talocrural, and subtalar joints.* The program should include 5 repetitions (30 seconds; grades I-IV mobilization at the therapist's discretion), twice per week for 4 weeks.
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 3 - Appendix 5	

* Mobilizations are techniques incorporating a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion.

SECTION 7.3

MANAGEMENT OF ACHILLES TENDINOPATHY

Quick Reference Guide – Management of Achilles Tendinopathy



SECTION 7.3.1

CARE PATHWAY FOR RECENT ONSET ACHILLES TENDINOPATHY (0 - 3 MONTHS POST-COLLISION)

The care pathway is presented in Figure 7.3.

At initial contact, health care professionals should educate and reassure the patient that Achilles tendinopathy will resolve in most patients. Patients greatly improve their recovery by actively participating in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first 3 months of care for Achilles tendinopathy is described below.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. Fractures can be ruled out using the Ottawa Ankle Rules (Appendix 7.A). The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the Achilles tendinopathy care pathway.

Table 7.J Risk factors of serious pathology (red flags) for Achilles tendinopathy

Risk factors of serious pathology identified during history or physical examination*
• Positive Ottawa Ankle Rules • Sudden snap or sharp pain in the Achilles region (Achilles tendon rupture) • Inability to plantar flex ankle • Gap above the heel

Patients with multiple injuries should be managed using all appropriate care pathways.

Monitor and Reassure the Patient

Patients with recent onset Achilles tendinopathy that results from a traffic collision suffer from a minor trauma to the leg. Patients need to be reassured about the benign and self-limited nature of recent onset Achilles tendinopathy. Health care professionals also need to reassure patients if there are no major structural or progressive pathologies (e.g., dislocations, fractures or infection) with their leg. Clinicians should monitor the progression of recent onset Achilles tendinopathy and ensure that patients are effectively coping with their symptoms.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered.[+]

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who have not significantly improved or recovered within the first 3 months after the injury should enter the care pathway for persistent Achilles tendinopathy described in section 7.3.2.

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* This list of risk factors of serious pathology was informed by the following references:
Carcia CR, Martin RL, Houck J, Wukich DK, Orthopaedic Section of the American Physical Therapy Association. Achilles pain, stiffness, and muscle power deficitis: Achilles tendinitis. J Orthop Sports Phys Ther. 2010 Sep; 40(9): A1-26.
Buschbacher R, Michael W (Eds.). Musculoskeletal, Sports and Occupational Medicine. New York: Demos Medical Publishing; 2010.

[+] The use of a valid and reliable condition-specific instrument (e.g. Victorian Institute of Sports Assessment – Achilles Questionnaire (VISA-A)) is encouraged but should not be used to measure overall recovery.

The care pathway is presented in Figure 7.3.

Patients who still experience symptoms and disability more than 3 months after the injury may benefit from receiving additional clinical care. The primary goals of clinical care are to promote recovery by reducing symptoms and return patients to their normal activities of daily living.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. Fractures can be ruled out using the Ottawa Ankle Rules (Appendix 7.A). The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the ankle sprain care pathway.

Table 7.J Risk factors of serious pathology (red flags) for Achilles tendinopathy

Risk factors of serious pathology identified during history or physical examination*
• Positive Ottawa Ankle Rules • Sudden snap or sharp pain in the Achilles region (Achilles tendon rupture) • Inability to plantar flex ankle • Gap above the heel

Patients with multiple injuries should be managed using all appropriate care pathways.

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about Achilles tendinopathy and address any misunderstandings or apprehension through education and reassurance. The health care professional needs to educate and reassure the patient about the benign and self-limited nature of Achilles tendinopathy and reinforce the importance of maintaining activities of daily living.

Deliver the Care Plan for Persistent Achilles Tendinopathy (4-6 months post-collision)

The goal of the care plan is to provide clinical interventions that promote resolution of symptoms and restoration of function. Patients requiring clinical care should be encouraged to participate in their program of care by remaining active.

* This list of risk factors of serious pathology was informed by the following references:
Carcia CR, Martin RL, Houck J, Wukich DK, Orthopaedic Section of the American Physical Therapy Association. Achilles pain, stiffness, and muscle power deficitis: Achilles tendinitis. J Orthop Sports Phys Ther. 2010 Sep; 40(9): A1-26.
Buschbacher R, Michael W (Eds.). Musculoskeletal, Sports and Occupational Medicine. New York: Demos Medical Publishing; 2010.

Health care professionals should discuss the treatment plan with their patients, emphasizing the risks and benefits of the care plan. Based upon the shared decision making by the patient and provider, the following therapeutic intervention is recommended:

- Shock-wave therapy

Interventions that are not recommended include:

- Night splint
- Semi-rigid brace

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

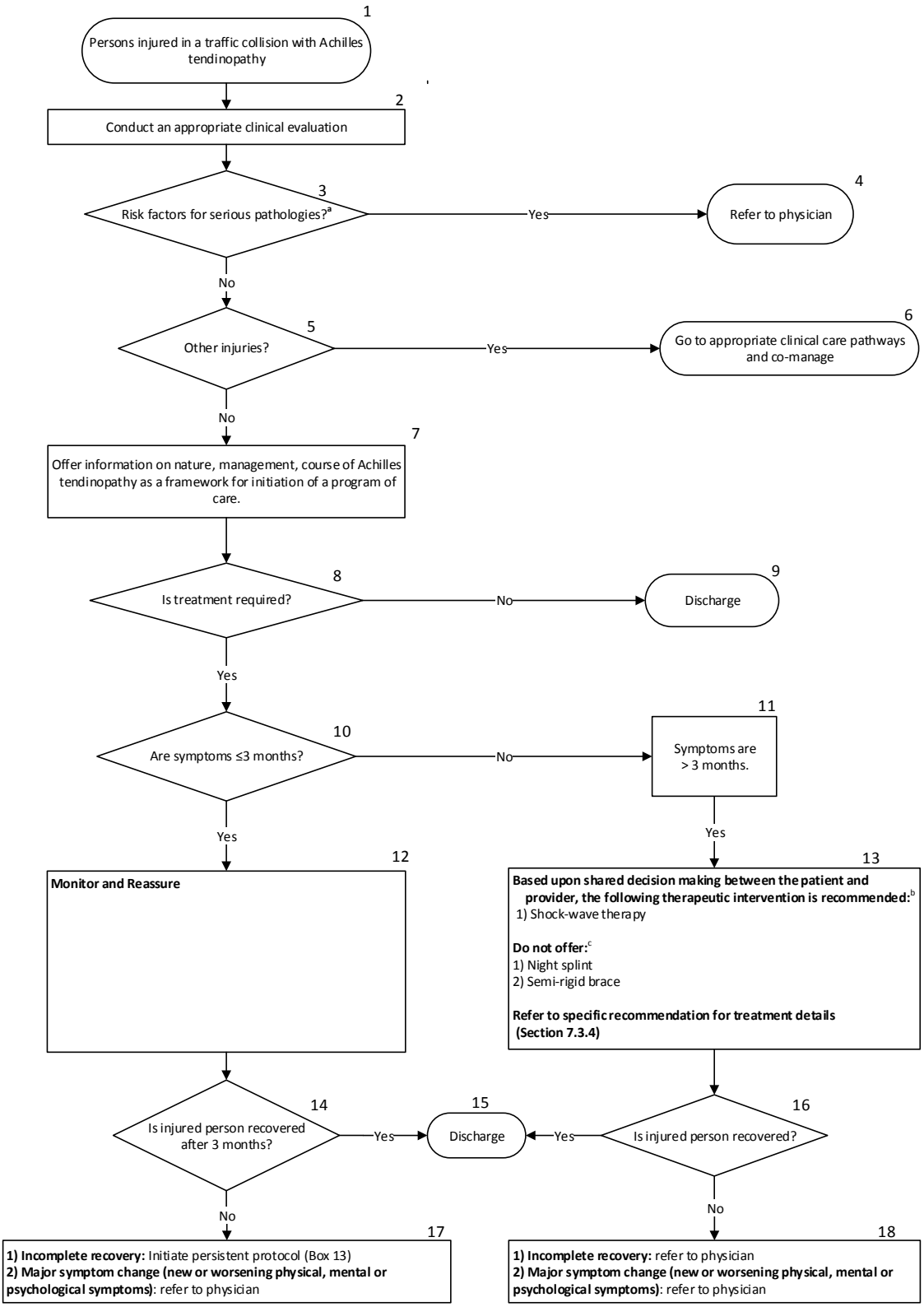
Patients should be discharged as soon as they have made significant improvement or recovered. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered*.

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who have not improved significantly or recovered should be referred to their physician for further evaluation.

* The use of a valid and reliable condition-specific instrument [e.g., Victorian Institute of Sports Assessment – Achilles Questionnaire (VISA-A)] is encouraged but should not be used to measure overall recovery.

Figure 7.3: Care Pathway for the Management of Achilles Tendinopathy



[a] **Risk factors for serious pathologies (also known as red flags): positive Ottawa Ankle Rules; sudden snap or sharp pain in the Achilles region (Achilles tendon rupture); inability to plantar flex ankle; gap above the heel**
[b] **This guideline does not include interventions for which there is a lack of evidence of effectiveness**
[c] **Based on evidence of no benefit to patients**

SECTION 7.3.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT ONSET ACHILLES TENDINOPATHY

Most individuals with Achilles tendinopathy recover from their injury. However, it is recommended that the following be performed as a component of standard clinical care.

- Monitor the symptoms.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the nature of their pain.
- Encourage patients to maintain their activities of daily living.
- Do not provide ineffective or experimental treatments.

SECTION 7.3.4

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT ACHILLES TENDINOPATHY

This section summarizes the key recommendations for the management of persistent Achilles tendinopathy for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 7.3.4.1

PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 7.K: Passive physical modalities for persistent Achilles tendinopathy

Recommendation 7.3.4.1.1	Offer shock-wave therapy* The program should include 2000 pulses/session (8 pulses/second, energy flux density=0.1mJ/mm^2, targeted circumferentially at area of maximum tenderness) provided 1 session per week for 3 weeks.
7.3.4.1.2	Do not offer night splint
7.3.4.1.3	Do not offer semi-rigid brace**
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 5 - Appendix 5	

* Shock-wave therapy is a passive physical modality that is placed onto the skin with sustained pressure to send sound waves into areas of soft tissue.
** Semi-rigid brace is not recommended for mid-portion Achilles tendinopathy.

Quick Reference Guide – Management of Plantar Fasciitis and Heel Pain

Symptoms ≤ 3 months post-collision	Symptoms > 3 months post-collision
For all injured persons with plantar fasciitis and heel pain: **Rule out** risk factors for serious pathologies[a] **Offer** information on nature, management, course of collision-related plantar fasciitis and heel pain as a framework for initiation of a program of care **Conduct** ongoing assessment for symptom improvement or progression during intervention and refer accordingly **Discharge** injured person as appropriate at any point during intervention and recovery	
Based upon shared decision making between the patient and provider, the following therapeutic intervention is recommended:[b] 1. Plantar fascia stretching **Refer to specific recommendation for treatment details (Section 7.4.3)**	**Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:**[b,c] **Home and clinic based interventions:** 1. Prefabricated foot orthoses for short-term improvement in function 2. Multimodal care that includes the combination of: a) Manipulation or mobilization of the hip, knee and ankle as indicated b) Clinical massage c) Home exercise **Refer to specific recommendation for treatment details (Section 7.4.4)**
Do Not Offer:[d] • Trigger point therapy to the gastrocnemii • Radial shock-wave therapy	**Do Not Offer:**[d] • Trigger point therapy to the gastrocnemii • Home-based static stretching of calf muscles • Low-Dye taping
Outcome: **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Initiate persistent protocol **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician	**Outcome:** **Recovered →** **Discharge** **Unrecovered:** **Incomplete recovery →** Refer to physician **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician

[a] Risk factors for serious pathologies (also known as red flags): positive Ottawa Ankle Rules; bruising, redness, edema; pain and/or burning in medial plantar region; atrophy of plantar pad; multiple joint pain, bilateral heel pain; acute injury with intense tearing sensation on the plantar surface of the foot; pain not relieved by rest
[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness
[c] The ordering of interventions does not reflect superiority of effectiveness
[d] Based on evidence of no benefit to patients

SECTION 7.4.1

CARE PATHWAY FOR RECENT ONSET PLANTAR FASCIITIS AND HEEL PAIN (0 - 3 MONTHS POST-COLLISION)

The care pathway is presented in Figure 7.4.

At initial contact, health care professionals should educate and reassure the patient that plantar fasciitis and heel pain will resolve in most patients. Patients greatly improve their recovery by actively participating in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first 3 months of care for plantar fasciitis is described below.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. Fractures can be ruled out using the Ottawa Ankle Rules (Appendix 7.A). The presence of a risk factor

for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the plantar fasciitis and heel pain care pathway.

Table 7.L Risk factors of serious pathology (red flags) for plantar fasciitis and heel pain

Risk factors of serious pathology identified during history or physical examination*
• Positive Ottawa Ankle Rules • Bruising, redness, edema • Pain and/or burning in medial plantar region • Atrophy of plantar pad • Multiple joint pain, bilateral heel pain • Acute injury with intense tearing sensation on the plantar surface of the foot • Pain not relieved by rest

Patients with multiple injuries should be managed using all appropriate care pathways.

Educate and Reassure the Patient

A patient-centred care plan should be developed in partnership with the patient. Patients need to be reassured about the benign and self-limited nature of plantar fasciitis and the importance of maintaining activity and movement. Health care professionals also need to reassure patients that there are no major structural or progressive pathologies (e.g., fractures or infection) in the heel. Risks and benefits of the care plan should be discussed with the patient.

Determine if Ongoing Clinical Care is Necessary

Health care professionals should first determine if the patient requires ongoing clinical care.

Deliver the Care Plan for recent onset plantar fasciitis (0-3 months post-collision)

Patients who require clinical care should be encouraged to actively participate in their care by staying active.

Health care professionals should discuss the treatment plan with their patients, emphasizing the risks and benefits of the care plan.

* This list of risk factors of serious pathology was informed by the following clinical practice guidelines and peer reviewed manuscripts:
Goff JD, Crawford R. Diagnosis and treatment of plantar fasciitis. American Family Physician. Sep 15 2011;84(6):676-682.
McPoil TG, Martin RL, Cornwall MW, Wukich DK, Irrgang JJ, Godges JJ. Heel pain--plantar fasciitis: clinical practice guildelines linked to the international classification of function, disability, and health from the orthopaedic section of the American Physical Therapy Association. The Journal of Orthopaedic and Sports Physical Therapy. Apr 2008;38(4):A1-A18.
Roddy E, Myers H, Thomas MJ, et al. The clinical assessment study of the foot (CASF): study protocol for a prospective observational study of foot pain and foot osteoarthritis in the general population. Journal of Foot and Ankle Research. 2011;4:22.

7.4.1 CARE PATHWAY FOR RECENT ONSET PLANTAR FASCIITIS AND HEEL PAIN (0 - 3 MONTHS POST-COLLISION)

Based upon shared decision making between the patient and provider, the following therapeutic intervention is recommended:

- Home-based plantar fascia stretching

Interventions that are not recommended include:

- Trigger point therapy to the gastrocnemii
- Radial shock-wave therapy

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered*.

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who have not significantly improved or recovered within the first 3 months after the injury should enter the care pathway for persistent plantar fasciitis and heel pain described in section 7.4.2.

SECTION 7.4.2

CARE PATHWAY FOR PERSISTENT PLANTAR FASCIITIS AND HEEL PAIN (4 - 6 MONTHS POST-COLLISION)

The care pathway is presented in Figure 7.4.

Patients who still experience symptoms and disability more than 3 months after the injury may benefit from receiving additional clinical care. The primary goals of clinical care are to promote recovery by reducing symptoms and return patients to their normal activities of daily living.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. Fractures can be ruled out using the Ottawa Ankle Rules (Appendix 7.A). The presence of a risk factor

* The use of a valid and reliable condition-specific instrument [e.g., Victorian Institute of Sports Assessment – Achilles Questionnaire (VISA-A)] is encouraged but should not be used to measure overall recovery.

for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the plantar fasciitis and heel pain care pathway.

Table 7.L Risk factors of serious pathology (red flags) for plantar fasciitis and heel pain

Risk factors of serious pathology identified during history or physical examination*
• Positive Ottawa Ankle Rules • Bruising, redness, edema • Pain and/or burning in medial plantar region • Atrophy of plantar pad • Multiple joint pain, bilateral heel pain • Acute injury with intense tearing sensation on the plantar surface of the foot • Pain not relieved by rest

Patients with multiple injuries should be managed using all appropriate care pathways.

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about plantar fasciitis and heel pain and address any misunderstandings or apprehension through education and reassurance. The health care professional needs to educate and reassure the patient about the benign and self-limited nature of plantar fasciitis and heel pain and reinforce the importance of maintaining activities of daily living.

Deliver the Care Plan for Persistent Plantar Heel Pain (4-6 months post-collision)

The goal of the care plan is to provide clinical interventions that promote resolution of symptoms and restoration of function. Patients requiring clinical care should be encouraged to participate in their program of care by remaining active.

Health care professionals should discuss treatment options with their patients and through a process of shared decision making, determine which therapeutic options they wish to pursue. Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:

- Prefabricated foot orthoses for short-term improvement in function
- Multimodal care that includes the combination of:

* This list of risk factors of serious pathology was informed by the following clinical practice guidelines and peer reviewed manuscripts:
Goff JD, Crawford R. Diagnosis and treatment of plantar fasciitis. American Family Physician. Sep 15 2011;84(6):676-682.
McPoil TG, Martin RL, Cornwall MW, Wukich DK, Irrgang JJ, Godges JJ. Heel pain--plantar fasciitis: clinical practice guildelines linked to the international classification of function, disability, and health from the orthopaedic section of the American Physical Therapy Association. The Journal of Orthopaedic and Sports Physical Therapy. Apr 2008;38(4):A1-A18.
Roddy E, Myers H, Thomas MJ, et al. The clinical assessment study of the foot (CASF): study protocol for a prospective observational study of foot pain and foot osteoarthritis in the general population. Journal of Foot and Ankle Research. 2011;4:22.

a) Manipulation or mobilization of the hip, knee and ankle as indicated
b) Clinical massage
c) Home exercise

Interventions that are not recommended include:

- Trigger point therapy to the gastrocnemii
- Home-based static stretching of calf muscles
- Low-Dye taping

Discuss the risks and benefits of the care plan with the patients.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

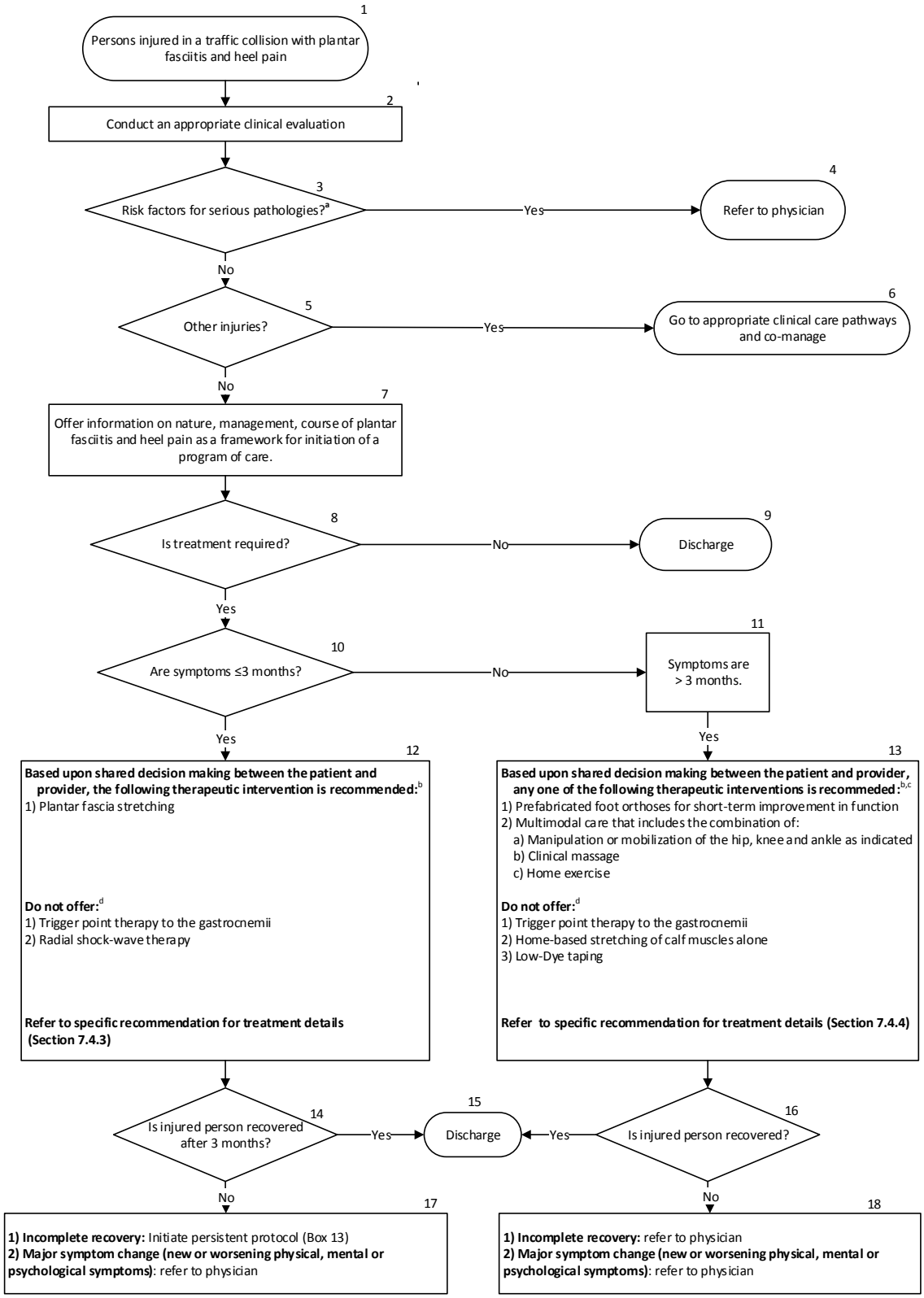
Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered.*

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

* The use of a valid and reliable condition-specific instrument [e.g., Lower Extremity Function Scale (LEFS)] is encouraged but should not be used to measure overall recovery.

7.4.2 CARE PATHWAY FOR PERSISTENT PLANTAR FASCIITIS AND HEEL PAIN (4 - 6 MONTHS POST-COLLISION)

Figure 7.4: Care Pathway for the Management of Plantar Fasciitis and Heel Pain



[a] **Risk factors for serious pathologies (also known as red flags): positive Ottawa Ankle Rules; bruising, redness, edema; pain and/or burning in medial plantar region; atrophy of plantar pad; multiple joint pain, bilateral heel pain; acute injury with intense tearing sensation on the plantar surface of the foot; pain not relieved by rest**

[b] **This guideline does not include interventions for which there is a lack of evidence of effectiveness**

[c] **The ordering of interventions does not reflect superiority of effectiveness**

[d] **Based on evidence of no benefit to patients**

SECTION 7.4.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT ONSET PLANTAR FASCIITIS AND HEEL PAIN

This section summarizes the key recommendations for the management of recent plantar fasciitis and heel pain for the period extending from 0 to 3 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limiting nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movements.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 7.4.3.1

EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common for the treatment and rehabilitation of heel pain.

Table 7.M: Exercise for recent plantar fasciitis and heel pain

Recommendation 7.4.3.1.1	Consider a home program of plantar fascia stretching (10 repetitions, 3 times daily, for 8 weeks)*
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 1 - Appendix 5	

* While seated cross the affected leg over the contralateral leg. Then, while using the hand of the affected side, place the fingers across the base of the toes on the sole of the foot (distal to the metatarsophalangeal joints) and pull the toes back toward the shin until feeling a stretch in the arch of the foot. Confirm that the stretching is correct by palpating the tension in the plantar fascia with the opposite hand while performing the stretching. In addition, take the heel with the opposite hand and impose an additional longitudinal stretch on the plantar fascia. Hold each stretch for a count of 10. The first stretch is to be done before taking the first step in the morning.

SECTION 7.4.3.2

SOFT TISSUE THERAPY

Soft tissue therapy is a mechanical therapy in which muscles, tendons, and ligaments are passively pressed or kneaded by hand or with mechanical devices. It includes relaxation massage, clinical massage, movement re-education and energy work.

Table 7.N: Soft tissue therapy for recent plantar fasciitis and heel pain

Recommendation 7.4.3.2.1	Do not offer trigger point therapy to the gastrocnemii
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 8 - Appendix 5	

SECTION 7.4.3.3

PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 7.O: Passive Physical Modalities for recent plantar fasciitis and heel pain

Recommendation 7.4.3.3.1	Do not offer radial shock-wave therapy*
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 5 - Appendix 5	

* Shock-wave therapy is a passive physical modality that is placed onto the skin with sustained pressure to send sound waves into areas of soft tissue.

SECTION 7.4.4

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT PLANTAR FASCIITIS AND HEEL PAIN

This section summarizes the key recommendations for the management of persistent plantar fasciitis and heel pain for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movements.
- Deliver time-limited care.
- Avoid providing ineffective or experimental treatments.

SECTION 7.4.4.1

EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common for the treatment and rehabilitation of heel pain.

Table 7.P: Exercise for persistent plantar fasciitis and heel pain

Recommendation 7.4.4.1.1	Do not offer home-based static stretching of calf muscles alone
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 1 - Appendix 5	

SECTION 7.4.4.2

SOFT TISSUE THERAPY

Soft tissue therapy is a mechanical therapy in which muscles, tendons, and ligaments are passively pressed or kneaded by hand or with mechanical devices. It includes relaxation massage, clinical massage, movement re-education and energy work.

Table 7.Q: Soft tissue therapy for persistent plantar fasciitis and heel pain

Recommendation 7.4.4.2.1	Do not offer trigger point therapy to the gastrocnemii

References:

- Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 8 - Appendix 5

SECTION 7.4.4.3

PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 7.R: Passive Physical Modalities for recent plantar fasciitis and heel pain

Recommendation 7.4.4.3.1	Offer prefabricated foot orthoses for short-term improvement in function for 8-10 weeks.
7.4.4.3.2	Do not offer low-Dye taping*

References:

- Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 5 - Appendix 5

* An orthopaedic/sports adhesive strapping technique which is isolated to the foot and aims to support the medial longitudinal arch of the foot and limit foot pronation.

Multimodal care includes at least two distinct therapeutic modalities. Our review of the evidence suggests that three interventions should be included in multimodal care: manual therapy (manipulation and mobilization), clinical massage and exercise.

Table 7.S: Multimodal care for persistent plantar fasciitis and heel pain

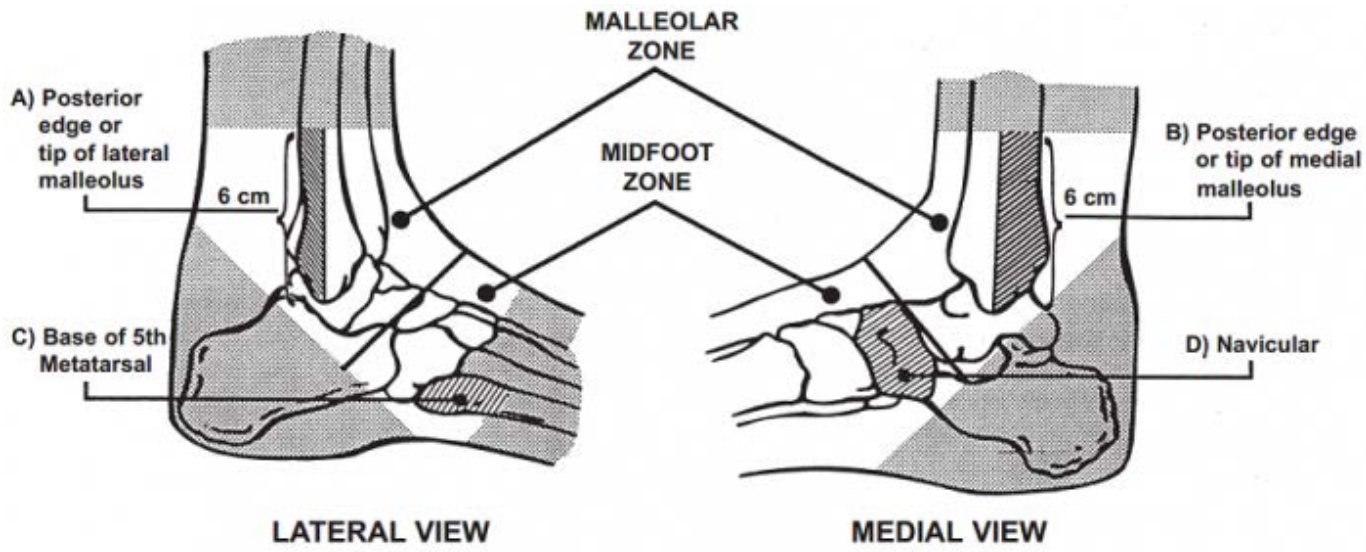
Recommendation 7.4.4.4.1	Consider a multimodal program of care that includes mobilization* and manipulation* (of the hip, knee, and ankle as indicated), as well as clinical massage** and home exercise***. Provide a maximum of 6 visits over 4 weeks
References: • Decision Determinants and Evidence Table for Lower Extremity Injuries – Report 4 - Appendix 5	

* Manipulation is a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion. Mobilization refers to a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion. For the purpose of this recommendation, manual therapy refers to manipulation or mobilization to the hip, knee and ankle as clinically indicated.
** Clinical massage is soft tissue therapies intended to target muscles with specific goals such as relieving pain, releasing muscle spasms or improving restricted motion, performed by a practitioner.
*** Exercise: gastrocnemius and soleus stretches; 2 repetitions, held for 30 seconds, 3 times daily.

Appendix 7.A

OTTAWA ANKLE RULES

Ottawa ankle rules for use of radiography in acute ankle injuries



An ankle x ray series is required only if there is any pain in malleolar zone and any of these findings

- Bone tenderness at A
- Bone tenderness at B
- Inability to bear weight both immediately and in emergency department

An foot x ray series is required only if there is any pain in midfoot zone and any of these findings

- Bone tenderness at C
- Bone tenderness at D
- Inability to bear weight both immediately and in emergency department

Adopted with permission from: Stiell I, Wells G, Laupacis A, et al. Multicentre trial to introduce the Ottawa ankle rules for use of radiography in acute ankle injuries. Multicentre Ankle Rule Study Group. BMJ (Clinical research ed.). Sep 2 1995;311(7005):594-597.

SECTION 8.0

GUIDELINE FOR THE CLINICAL MANAGEMENT OF TEMPOROMANDIBULAR DISORDERS

This evidence-based guideline establishes the best practice for the clinical management of temporomandibular disorders (TMD) caused or exacerbated by a motor vehicle collision. The guideline covers recent onset (0-3 months post-collision) and persistent (4-6 months post-collision) TMD; it does not cover TMD persisting for more than six months post-collision.

In this guideline, TMD is defined as a group of conditions that affect the masticatory muscles, the temporomandibular joint and its surrounding structures. TMD includes sprain and strain injuries. TMD can present as pain, abnormal joint sounds, limited jaw movement, and joint and muscle tenderness. This guideline is not indicated for conditions that include the presence of major structural or pathological causes of temporomandibular pain, limited movement, and tenderness.

About 15% of individuals involved in a motor vehicle collision experience symptoms of TMD, such as reduced or painful jaw movements. Most individuals recover from TMD.

TMD caused or exacerbated by a motor vehicle collision is commonly associated with neck pain. Patients with TMD and neck pain and its associated disorders (NAD) should also receive care as recommended in the NAD care pathways described in Chapter 4.

Patients with multiple injuries should be managed using all appropriate care pathways.

The clinical management recommended in this guideline aims to: 1) accelerate recovery; 2) reduce the intensity of symptoms; 3) promote early restoration of function; 4) prevent chronic pain and disability; 5) improve health-related quality of life; 6) reduce recurrences; and 7) promote active participation of patients in their care.

Patient-centered care is an internationally recognized principle that was fundamental to the development of this guideline. This guideline reinforces the importance of communication and partnership between patients and health care professionals.

All recommendations included in this guideline are derived from a synthesis of studies with low risk of bias.

Interventions not described in this guideline are not recommended for the management of patients with TMD because of a lack of evidence about their effectiveness and safety.

Health care professionals eligible to provide care under this guideline are those defined by the Statutory Accident Benefits Schedules (SABS).

All recommendations presented in this guideline integrate the:

- Key decision determinants developed by the Ontario Health Technology Advisory Committee (OHTAC);
- Best evidence obtained from the current scientific literature; and
- Qualitative research exploring the experiences of persons treated for traffic injuries in Ontario

All background documents and references available at http://www.fsco.gov.on.ca

Quick Reference Guide – Management of Temporomandibular Disorders

Symptoms ≤ 3 months post-collision	Symptoms > 3 months post-collision
For all injured persons with temporomandibular disorders and no risk factors for serious pathologies[a]: **Offer** information on nature, management, course of TMD as a framework for initiation of a program of care **Conduct** ongoing assessment for symptom improvement or worsening/progress during intervention period and refer accordingly **Reassess and Monitor** the presence of acute stress disorder, post-traumatic stress disorder, kinesiophobia, passive coping, depression, anxiety, anger, frustration and fear **Discharge** injured person as appropriate at any point during intervention and recovery	
Based upon shared decision making between patient and provider, the following therapeutic option is recommended:[b,c] 1) Monitor and reassure **Refer to section 8.1.3**	**Based upon shared decision making between patient and provider, any one of the following therapeutic options is recommended:[b,c,d]** **Home and clinic based interventions:** 1) Self-care management program (TMD education, monitoring patient expectations, attention) 2) Intraoral myofascial therapy 3) Cognitive-behavioural therapy by a health care professional trained in cognitive-behavioural therapy **Refer to specific recommendation for treatment details (Section 8.1.4)**
	Do Not Offer:[e] • Occlusal device for pain and range of motion
Outcome: **Recovered →** Discharge **Incomplete recovery →** Initiate persistent protocol **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician or dentist	**Outcome:** **Recovered →** Discharge **Incomplete recovery →** Refer to physician or dentist **Major symptom change (new or worsening physical, mental or psychological symptoms) →** Refer to physician or dentist

[a] Risk factors for serious pathologies (also known as red flags): Fracture of the mandible (swelling, malocclusion, limited movement), dislocation of the mandibular condyle (muscle spasm, inability to close the mouth, anxiety), fracture/dislocation of the cervical spine (positive Canadian C-Spine rule), cancer (history of cancer, unexplained weight loss, nocturnal pain, age >50), infection (fever, intravenous drug use, recent infection), osteoporotic fractures (history of osteoporosis, use of corticosteroid, older age)
[b] Selection of therapeutic options in the guideline should be based upon shared decision making between patient and provider
[c] Unlisted interventions are not recommended due to lack of admissible quality of evidence to make an informed decision
[d] The ordering of interventions does not reflect superiority of effectiveness
[e] Based on evidence of no benefit to patients

SECTION 8.1.1

CARE PATHWAY FOR RECENT ONSET TEMPOROMANDIBULAR DISORDERS (0-3 MONTHS POST-COLLISION)

The care pathway is presented in Figure 8.1.

At initial contact, health care professionals should educate and reassure the patient that TMD will resolve within a few months of symptom onset. Patients greatly improve their recovery by actively participating in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first three months of care for TMD is described below.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional.

However, once a pathology has been ruled out, the patient should be treated according to the TMD clinical pathway.

Table 8.A Risk factors of serious pathology (red flags) for temporomandibular disorders

Possible Cause	Risk factors of serious pathology identified during history or physical examination*
Fracture of the mandible	• Swelling • Malocclusion • Limited movement
Dislocation of the mandibular condyle	• Muscle spasm, • Inability to close the mouth • Anxiety
Fracture/dislocation of the cervical spine	• Positive Canadian C-spine rule
Cancer	• History of cancer • Unexplained weight loss • Nocturnal Pain • Age > 50
Infection	• Fever • Intravenous drug use • Recent infection
Osteoporotic fractures	• History of osteoporosis • Use of corticosteroid • Older age

* This list of risk factors of serious pathology was informed from the following peer reviewed articles rather than being developed from a systematic review of the literature on "red flags":
Chou R, Qaseem A, Snow S, Casey D; Cross JT, Shekelle P, Owens DK for the Clinical Efficacy Assessment Subcommittee of the American College of Physicians and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel. Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147: 478-491.
Downie A, Williams CM, Henschke N, Hancock MJ, Ostelo RWJG, de Vet HC, Macaskill P, Irwig L, van Tulder MW, Koes BW, Maher CG.Red flags to screen for malignancy and fracture in patients with low back pain: systematic review. BMJ 2013;347:f7095 doi: 10.1136/bmj.f7095); 75.
Nordin M, Carragee, EJ, Hogg-Johnson S, Schecter Weiner S, Hurwitz EL, Peloso PM, Guzman J, van der Velde G, Carroll LJ, Holm LW, Côté P, Cassidy JD, Haldeman S. Assessment of neck pain and its associated disorders. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and its Associated Disorders. Spine. 2008; 33 (4S): S101-S122.

8.1.1 CARE PATHWAY FOR RECENT ONSET TEMPOROMANDIBULAR DISORDERS (0-3 MONTHS POST-COLLISION)

Patients who also have neck pain and associated disorders or other injuries should be managed using the appropriate care pathways.

Patients with multiple injuries should be managed using all appropriate care pathways.

Monitor and Reassure the Patient

There is a lack of effective interventions to manage recent onset TMD. However, 50% of individuals with painful or restricted jaw movement following a traffic collision report complete recovery within 6 weeks of their injury. TMD rarely occurs on its own following traffic collisions; it is commonly associated with NAD. Clinicians should monitor the progression of TMD and ensure that patients are effectively coping with their symptoms.

Therefore, it is important that the health care professional reassures and explains to patients that most will recover spontaneously. Patients need to be reassured about the benign and self-limited nature of TMD. Health care professionals also need to reassure patients that there are no major structural or progressive pathologies (e.g., dislocations, fractures or infection) in the masticatory muscles, the temporomandibular joint and surrounding structures. Discuss the risks and benefits of the care plan with the patient.

Reassess and Take the Indicated Course of Action

Reassess patients who have not recovered within the first 3 months to determine if clinical care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: “How well do you feel you are recovering from your injuries?” The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, or 7) worse than ever. Patients reporting to be ‘completely better’ or ‘much improved’ should be considered recovered. Patients who have not recovered should follow the care pathway outlined in the guideline.*

Patients with worsening symptoms and those who develop new physical, mental or psychological symptoms should be referred to their dentist or physician for further evaluation at any time point during their care.

Patients who have not significantly improved or recovered within the first 3 months after the injury should enter the care pathway for persistent TMD described in section 8.1.2.

* The use of a valid and reliable instrument (e.g., Visual Analogue Scale for pain intensity) is encouraged but should not be used to measure overall recovery.

The care pathway is presented in Figure 8.1.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out signs and symptoms of serious pathologies (also known as red flags).

If a patient presents with signs and symptoms of serious pathologies, they should be referred to the appropriate health care professional.

Patients who also have neck pain and associated disorders or other injuries should be managed using the appropriate care pathways.

Educate and Reassure the Patient

The health care professional should aim to understand the patient's beliefs and expectations about TMD and address any misunderstandings or apprehension through education and reassurance. The health care professional needs to educate and reassure the patient about the benign and self-limited nature of TMD and reinforce the importance of maintaining activities of daily living.

Deliver the Care Plan

The goal of the care plan is to provide clinical interventions that promote resolution of symptoms and restoration of function.

Health care professionals should discuss treatment options with their patients and, through a process of shared decision making, determine which therapeutic option(s) they wish to pursue. Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:

- Self-care management
- Intraoral myofascial therapy
- Cognitive behavioural therapy

The following intervention is not recommended:

- Occlusal device for pain reduction and improvement in range of motion

Discuss the risks and benefits of the care plan with the patient.

8.1.2 CARE PATHWAY FOR PERSISTENT TEMPOROMANDIBULAR DISORDERS (4-6 MONTHS POST-COLLISION)

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

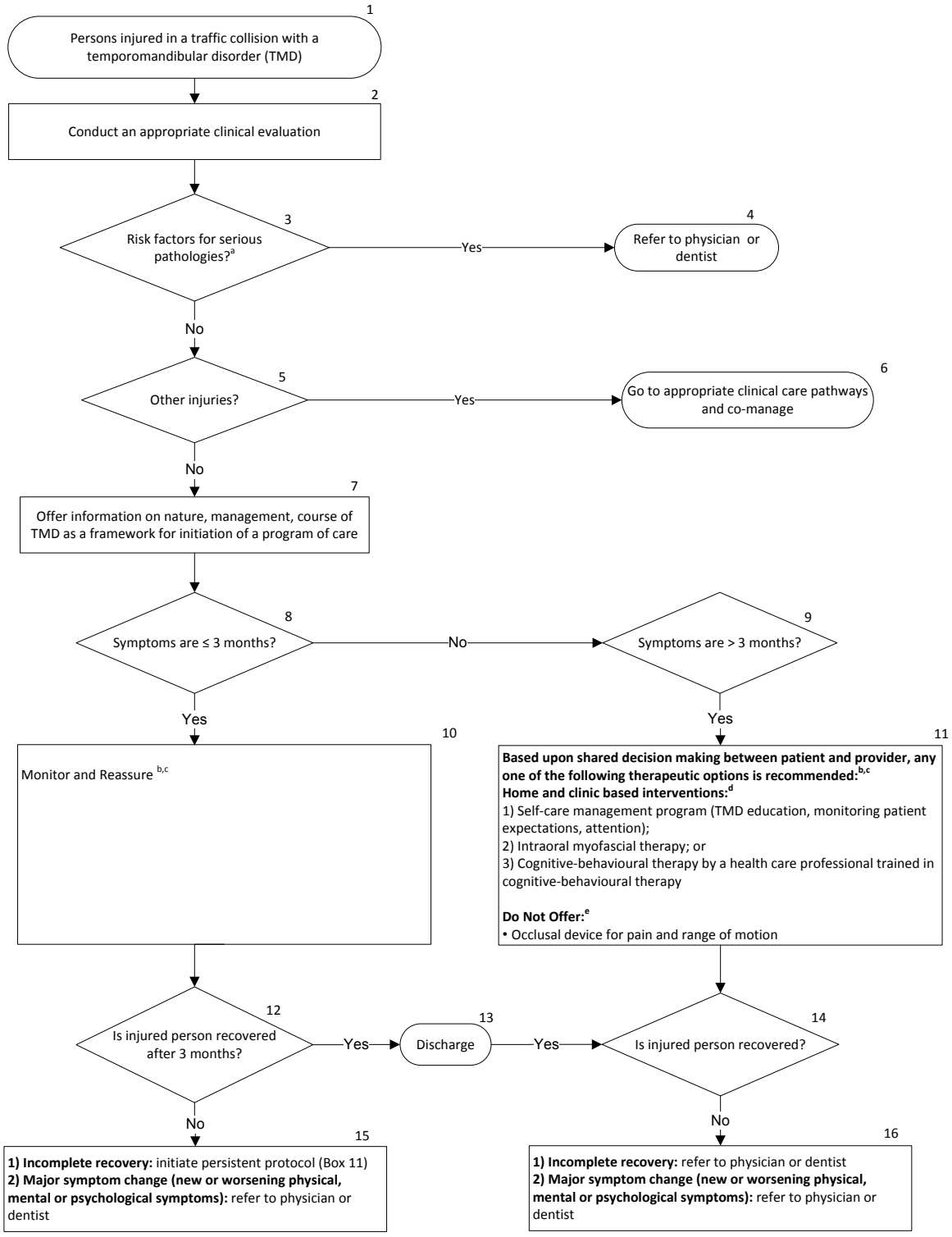
Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, or 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered. Patients who have not recovered should follow the care pathway outlined in the guideline.*

Patients with worsening symptoms and those who develop new physical, mental or psychological symptoms should be referred to their dentist or physician for further evaluation at any time point during their care.

* The use of a valid and reliable instrument (e.g., Visual Analogue Scale for pain intensity) is encouraged but should not be used to measure overall recovery.

8.1.2 CARE PATHWAY FOR PERSISTENT TEMPOROMANDIBULAR DISORDERS (4-6 MONTHS POST-COLLISION)

Figure 8.1: Management of Injured Persons with Temporomandibular Disorders



[a]Risk factors for serious pathologies (also known as red flags): Fracture of the mandible (swelling, malocclusion, limited movement), dislocation of the mandibular condyle (muscle spasm, inability to close the mouth, anxiety), fracture/dislocation of the cervical spine (positive Canadian C-Spine rule), cancer (history of cancer, unexplained weight loss, nocturnal pain, age >50), infection (fever, intravenous drug use, recent infection), osteoporotic fractures (history of osteoporosis, use of corticosteroid, older age)

[b]Selection of therapeutic options in the guideline should be based upon shared decision making between patient and provider

[c]Unlisted interventions are not recommended due to lack of admissible quality of evidence to make an informed decision

[d]The ordering of interventions does not reflect superiority of effectiveness

[e]Based on evidence of no benefit to patients

SECTION 8.1.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT ONSET TEMPOROMANDIBULAR DISORDERS

Most individuals with TMD recover on their own within a few weeks of the injury. However, it is recommended that the following be performed as a component of standard clinical care.

- Monitor the symptoms.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the nature of their pain.
- Encourage patients to maintain their activities of daily living.
- Do not provide ineffective or experimental treatments.

SECTION 8.1.4

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT TEMPOROMANDIBULAR DISORDERS

This section summarizes the key recommendations for the management of TMD for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Encourage patients to maintain their activities of daily living.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 8.1.4.1

▸ SELF-CARE MANAGEMENT

Patient education aims to enable individuals to make informed decisions about their personal health-related behaviour. Structured education strategies refer to standardized interventions such as scripted discussion, pamphlets or videos. Educational interventions should begin with an assessment of the person's knowledge of the injury and their health goals. The content of the structured education interventions may include (but is not limited to): reassurance about the favourable prognosis of TMD; advice on return to activities; maintenance of activities of daily living; discussion of expected pain and pain mechanism; discussion of prognosis; pain coping skills; and self-care strategies or general health.

Table 8.B: Self-care management for persistent temporomandibular disorders

Recommendation 8.1.4.1.1	Consider a maximum of 4 sessions over 8 weeks of structured self-care management program.*
References: • Decision Determinants and Evidence Table for TMD – Report 1 – Appendix 6	

* Structured self-care management involving distribution of information about temporomandibular disorders and a patient manual on general health information (e.g. pain medications, communicating with health care providers, and making treatment decisions). Each session focused on reviewing main points of the manual and discussing the patient's reactions and questions.

SECTION 8.1.4.2

▸ SOFT TISSUE THERAPY

Soft tissue therapy is a mechanical therapy in which muscles, tendons, and ligaments are passively pressed or kneaded by hand or with mechanical devices. It includes relaxation massage, clinical massage, movement re-education and energy work.

Table 8.C: Soft tissue therapy for persistent temporomandibular disorders

Recommendation 8.1.4.2.1	Offer up to 10 sessions over 5 weeks of intraoral myofascial therapy.*
References: • Decision Determinants and Evidence Table for TMD – Report 1 – Appendix 6	

* Intraoral myofascial therapy involving: a) intraoral temporalis release; b) intraoral medial and lateral pterygoid technique; and c) Intraoral spenopalatine ganglion technique.

SECTION 8.1.4.3

▸ PSYCHOLOGICAL INTERVENTION

A psychological intervention is a method used to treat psychological distress, consequences of musculoskeletal injuries (such as pain), or psychological disorders; primarily (but not exclusively) by verbal or non-verbal communication. Psychological interventions can be broadly subdivided into several theoretical orientations, including but not limited to psychodynamic, psychoanalytic, behavioural/cognitive behavioural, humanistic and existential, family/systems approaches and combinations of these approaches. Psychological interventions can include (but are not limited to) in-person psycho-education; booklet/written material that includes a psycho-educational component; cognitive-behavior interventions, or a guided psychological self-help intervention.

Table 8.D: Psychological interventions for persistent temporomandibular disorders

Recommendation 8.1.4.3.1	Consider a maximum of 4 sessions over 8 weeks of cognitive-behavioural therapy.*
References: • Decision Determinants and Evidence Table for TMD – Report 1 – Appendix 6	

* Cognitive-behavioural pain management involves progressive relaxation and abdominal/diaphragmatic breathing techniques, a relaxation audiotape, discussion regarding fear-avoidance, the identification and challenging of negative thoughts in response to pain, relapse prevention, ways to maintain gains and how to deal with setbacks.

SECTION 8.1.4.4

▸ PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 8.E: Passive physical modalities for persistent temporomandibular disorders

Recommendation 8.1.4.4.1	Do not offer an occlusal device.*
References: • Decision Determinants and Evidence Table for TMD – Report 1 – Appendix 6	

* An occlusal device includes any removable artificial occlusal surface used to affect the relationship of the mandible to the maxillae. (http://www.academyofprosthodontics.org/_Library/ap_articles_download/GPT8.pdf)

SECTION 9.0

RECOMMENDATION FOR THE CLINICAL MANAGEMENT OF MILD TRAUMATIC BRAIN INJURY (MTBI)

SECTION 9.0

RECOMMENDATION FOR THE CLINICAL MANAGEMENT OF MILD TRAUMATIC BRAIN INJURY (MTBI)

SECTION 9.1

BACKGROUND

Mild traumatic brain injury (MTBI) is an acute brain injury resulting from mechanical energy to the head from external physical forces [1]. MTBI is common with 70-90% of all treated brain injuries being considered as mild [1]. In Ontario, Canada, the incidence of MTBI presenting to emergency departments or family physicians ranges from 493 per 100,000 to 653 per 100,000 [2]. The best available evidence suggests that most individuals with MTBI substantially improve or recover within a few months [3, 4].

MTBI presents clinically with physical (e.g., headache, nausea, dizziness), behavioural/emotional (e.g., fatigue, depression, sleep problems), and cognitive symptoms (e.g., feeling slowed down, concentration, memory difficulties) [5]. Although most individuals with MTBI recover within days to months, cognitive deficits may persist past six months [3]. These individuals may continue to experience decreased functional ability, emotional distress, and delayed return to work or school [6]. Therefore, effectively managing patients with MTBI is important to prevent chronic symptoms and disability.

The clinical management of MTBI remains controversial [7] and evidence-based clinical practice guidelines have been designed to assist with the management of MTBI. Clinical practice guidelines are systematically developed statements designed to help clinicians provide quality care to patients [8, 9]. However, the quality of commonly used guidelines varies greatly [10]. Therefore, the methodological quality of guidelines should be assessed prior to their use in practice for patients.

A recent systematic review of clinical practice guidelines found that only 50% of guidelines available to inform the management of traffic injuries meet accepted quality standards [10]. Of those, three addressed the early management of MTBI [6, 11, 12]. One of these guidelines entitled “Guidelines for Mild Traumatic Brain Injury and Persistent Symptoms, First Edition” was published in 2008 by the Ontario Neurotrauma Foundation [12]. In 2013, a revised version of the guideline (Guidelines for Concussion/Mild Traumatic Brain Injury and Persistent Symptoms, Second Edition) was published [13].

The availability of a high quality, Ontario-based and current clinical practice guideline for the management of MTBI is relevant to this project. Therefore, the guideline expert panel recommended that a detailed evaluation of the “Guidelines for Concussion/Mild Traumatic Brain Injury and Persistent Symptoms, Second Edition” [13] is conducted to determine its methodological quality and applicability.

This report summarizes the evaluation of the “Guidelines for Concussion/Mild Traumatic Brain Injury and Persistent Symptoms, Second Edition” [13] and recommends that the guideline be used for the management of MTBI resulting from traffic collisions in Ontario.

The summary report is available in appendix 7.

SECTION 9.2

▸ REVIEW PANEL

Dr. Pierre Côté (Chair) formed a seven member multidisciplinary review panel to evaluate the quality of the "Guidelines for Concussion/Mild Traumatic Brain Injury and Persistent Symptoms, Second Edition" [13]. Dr. Jessica Wong chaired the review panel. Each member independently appraised the quality of the guidelines using the Appraisal of Guidelines for Research and Evaluation version II (AGREE II) instrument [14-16].

SECTION 9.3

▸ CRITICAL APPRAISAL OF THE MTBI GUIDELINES

The AGREE II instrument was used to evaluate the guideline. The AGREE II instrument is used internationally to assess the development and reporting of guidelines. It was developed in 2003 by the AGREE Collaboration, which is an international team of guideline developers and researchers [14-16]. The AGREE II has been used to evaluate guidelines for the management of various conditions, including cancer, osteoarthritis, cardiac conditions, stroke, and chronic pain. This instrument has also been found to be valid and reliable [14-16]. The AGREE II instrument includes 23 items and six quality-related domains. Each domain assesses the methodological quality and reporting in the following areas: 1) scope and purpose; 2) stakeholder involvement; 3) rigour of development; 4) clarity of presentation; 5) applicability; and 6) editorial independence.

SECTION 9.4

▸ RESULTS OF THE REVIEW

The review panel rated the overall quality of the guideline as high. The review panel stated that the clinical recommendations in the guideline were relevant to health care professionals who manage MTBI related to traffic collisions. Therefore, the review panel unanimously recommended that the guidelines should be used to guide the treatment and rehabilitation of MTBI related to traffic collisions. The recommendation was approved by the Guideline Expert Panel.

SECTION 9.5

▸ MANAGEMENT OF MTBI

Health care professionals who care for patients with MTBI should follow the recommendations outlined in the "Guidelines for Concussion/Mild Traumatic Brain Injury and Persistent Symptoms, Second Edition" [13].

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SECTION 10.0

GUIDELINE FOR THE CLINICAL MANAGEMENT OF LOW BACK PAIN WITH AND WITHOUT RADICULOPATHY

SECTION 10.0

GUIDELINE FOR THE CLINICAL MANAGEMENT OF LOW BACK PAIN WITH AND WITHOUT RADICULOPATHY

This evidence-based guideline establishes the best practice for the clinical management of non-specific low back pain that is caused or exacerbated by a motor vehicle collision. This guideline covers recent onset (0-3 months post-collision) and persistent (4-6 months post-collision) non-specific low back pain; it does not cover non-specific low back pain that persists for more than 6 months post-collision.

In this guideline, non-specific low back pain is defined as low back pain with or without radiculopathy in the absence of specific pathological entities (i.e., fracture, dislocation, neoplasm, infection, or systemic disease). The clinical management of low back pain with or without radiculopathy is outlined in sections 10.1 and 10.2.

This guideline is not indicated for conditions that include the presence of major structural or other pathological causes of low back pain.

In Canada, 60% of people with neck pain and associated disorders related to motor vehicle collisions experience low back pain. Most people recover from low back pain.

The clinical management recommended in this guideline aims to: 1) accelerate recovery; 2) reduce the intensity of symptoms; 3) promote early restoration of function; 4) prevent chronic pain and disability; 5) improve health-related quality of life; 6) reduce recurrences; and 7) promote active participation of patients in their care.

Patients with multiple injuries should be managed using all appropriate care pathways. For example, patients with low back pain commonly suffer from neck pain. Patients with low back pain and neck pain and its associated disorders (NAD) should also receive care as recommended in the NAD care pathways described in Chapter 4.

Patient-centered care is an internationally recognized principle that was fundamental to the development of this guideline. This guideline reinforces the importance of communication and partnership between patients and health care professionals.

All recommendations included in this guideline are derived from a synthesis of high quality clinical practice guidelines.

Interventions not described in this guideline are not recommended for the management of patients with non-specific low back pain because of a lack of evidence about their effectiveness and safety.

Health care professionals eligible to provide care under this guideline are those defined by the Statutory Accident Benefits Schedules (SABS).

This guideline is organized into two sections. Each section provides evidence-based recommendations for the clinical management of non-specific low back pain:

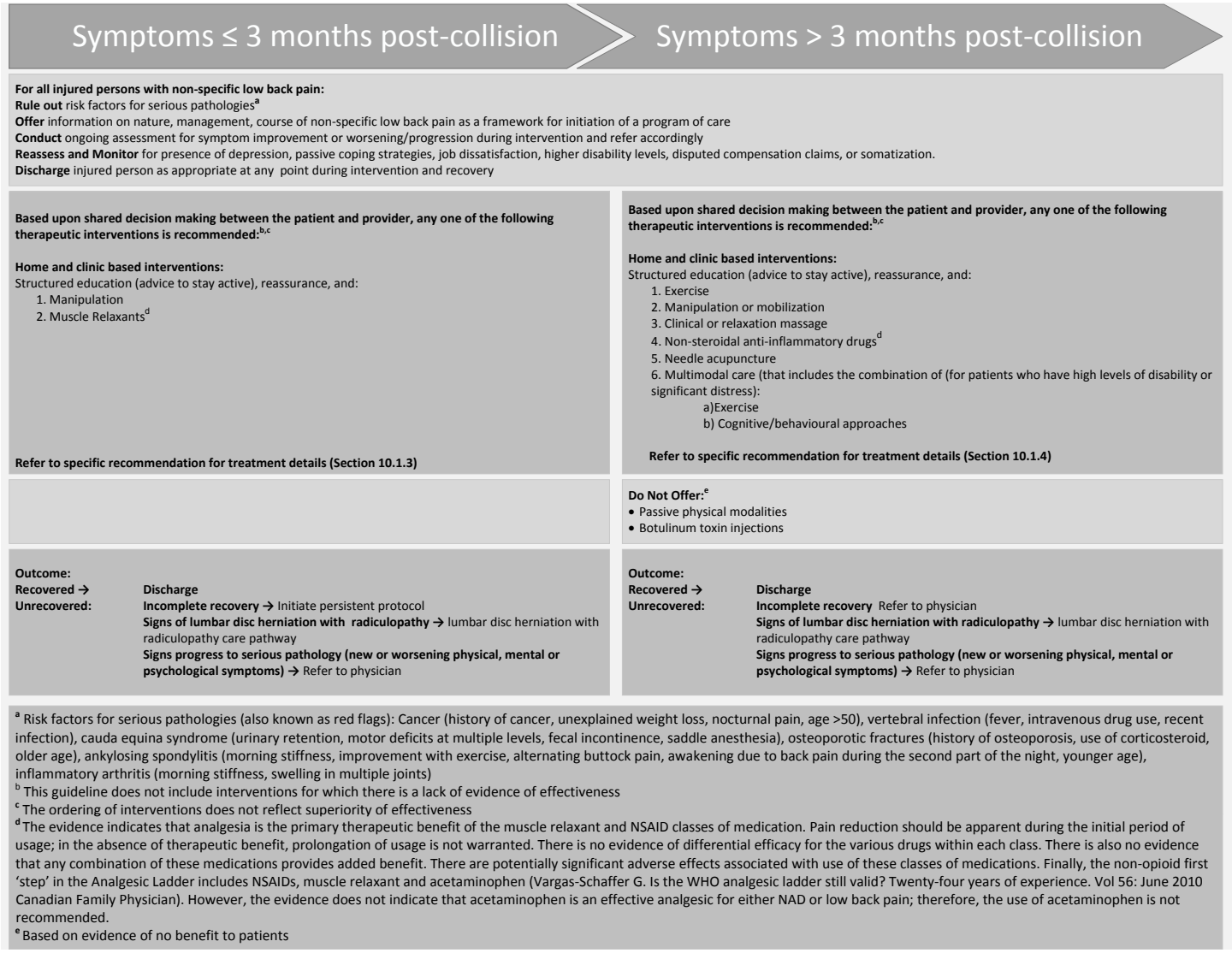
- Section 10.1 - Management of non-specific low back pain
- Section 10.2 - Management of lumbar disc herniation with radiculopathy

All recommendations presented in this guideline integrate the:

- Key decision determinants based upon the framework developed by Ontario Health Technology Advisory Committee (OHTAC);
- Best evidence obtained from a critical review of current scientific literature; and
- Qualitative research exploring the experiences of persons treated for traffic injuries in Ontario

All background documents and references are available at http://www.fsco.gov.on.ca

Quick Reference Guide – Management of Non-specific Low Back Pain



[a] Risk factors for serious pathologies (also known as red flags): Cancer (history of cancer, unexplained weight loss, nocturnal pain, age >50), vertebral infection (fever, intravenous drug use, recent infection), cauda equina syndrome (urinary retention, motor deficits at multiple levels, fecal incontinence, saddle anesthesia), osteoporotic fractures (history of osteoporosis, use of corticosteroid, older age), ankylosing spondylitis (morning stiffness, improvement with exercise, alternating buttock pain, awakening due to back pain during the second part of the night, younger age), inflammatory arthritis (morning stiffness, swelling in multiple joints)

[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness

[c] The ordering of interventions does not reflect superiority of effectiveness

[d] The evidence indicates that analgesia is the primary therapeutic benefit of the muscle relaxant and NSAID classes of medication. Pain reduction should be apparent during the initial period of usage; in the absence of therapeutic benefit, prolongation of usage is not warranted. There is no evidence of differential efficacy for the various drugs within each class. There is also no evidence that any combination of these medications provides added benefit. There are potentially significant adverse effects associated with use of these classes of medications. Finally, the non-opioid first 'step' in the Analgesic Ladder includes NSAIDs, muscle relaxant and acetaminophen (Vargas-Schaffer G. Is the WHO analgesic ladder still valid? Twenty-four years of experience. Vol 56: June 2010 Canadian Family Physician). However, the evidence does not indicate that acetaminophen is an effective analgesic for either NAD or low back pain; therefore, the use of acetaminophen is not recommended.

[e] Based on evidence of no benefit to patients

SECTION 10.1.1

CARE PATHWAY FOR RECENT ONSET NON-SPECIFIC LOW BACK PAIN (0 - 3 MONTHS POST-COLLISION)

The care pathway is presented in Figure 10.1.

At initial contact, health care professionals should educate and reassure the patient that non-specific low back pain will resolve within a few months of symptom onset. Patients greatly improve their recovery by actively participating in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first three months of care for non-specific low back pain is described below.

10.1.1 CARE PATHWAY FOR RECENT ONSET NON-SPECIFIC LOW BACK PAIN (0 - 3 MONTHS POST-COLLISION)

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the non-specific low back pain care pathway.

Table 10.A Risk factors of serious pathology (red flags) for low back pain

Possible Cause	Risk factors of serious pathology identified during history or physical examination*
Cancer	• History of cancer • Unexplained weight loss • Nocturnal pain • Age > 50
Vertebral infection	• Fever • Intravenous drug use • Recent infection
Cauda equina syndrome	• Urinary retention • Motor deficits at multiple levels • Fecal incontinence • Saddle anesthesia
Osteoporotic fractures	• History of osteoporosis • Use of corticosteroid • Older age
Ankylosing spondylitis	• Morning stiffness • Improvement with exercise • Alternating buttock pain • Awakening due to back pain during the second part of the night • Younger age
Inflammatory arthritis	• Morning stiffness • Swelling in multiple joints

* Adapted from Chou et al. Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147:478-491.

If neurological signs related to a lumbar disc herniation with radiculopathy are present, the patient should be managed under the "Care Pathway for the Management of Lumbar Disc Herniation with Radiculopathy" (see section 10.2).

Assess the Prognostic Factors

Assess the prognostic factors for delayed recovery. Most patients recover from their injury. Patients with the following prognostic factors may have a higher risk for delayed recovery:*

- Depression
- Passive coping strategies
- Job dissatisfaction
- High disability levels
- Disputed compensation claims
- Somatization

Educate and Reassure the Patient

Develop a patient-centred care plan in partnership with the patient.

Health care professionals need to reassure patients that there are no major structural or progressive pathologies (such as a fracture) in their back.

Prognostic factors for poor recovery should be addressed when present. The care should start with education and reassurance about the benign and self-limited nature of low back pain and the importance of maintaining activity and movement. This is particularly important when the patient reports poor expectation of recovery.

It is also important to reassure patients that it is normal to feel some anxiety, distress or anger following a traffic collision. In the presence of such symptoms or emotions, the health care professional should listen to the patient's concerns, discuss them and adjust the care plan accordingly.

Determine if Ongoing Clinical Care is Necessary

Health care professionals should first determine if the patient requires ongoing clinical care. Patients with mild low back pain may not require ongoing clinical care. Rather, patients can be managed with reassurance, education, returning to usual activities as tolerated, and staying active.

Deliver the Care Plan for Recent Onset Non-specific Low Back Pain (0-3 months post-collision)

Patients who require ongoing clinical care should be encouraged to actively participate in their care by returning to usual activities as tolerated and staying active on a regular basis. Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:

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* Chou et al. Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147:478-491

- Structured patient education
- Manipulation
- Muscle relaxants

Discuss the risks, benefits, and adverse events of selected interventions in the care plan with the patient.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered. Patients who have not recovered should follow the care pathway outlined in the guideline.*

Patients who develop lumbar disc herniation with radiculopathy should be managed according to the care pathway for the management of lumbar disc herniation with radiculopathy (section 10.2).

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms (other than lumbar disc herniation with radiculopathy) should be referred to their physician for further evaluation at any time point during their care.

Patients who have not significantly improved or recovered within the first 3 months after the injury should enter the care pathway for persistent non-specific low back pain described in section 10.1.2.

SECTION 10.1.2

CARE PATHWAY FOR PERSISTENT NON-SPECIFIC LOW BACK PAIN (4 - 6 MONTHS POST-COLLISION)

The care pathway is presented in Figure 10.1.

Patients who still experience symptoms and disability more than 3 months after the injury may benefit from receiving additional clinical care. The primary goals of the clinical care are to promote recovery by reducing symptoms and return patients to their normal activities of daily living. The care plan should focus on exercise and movement, but can be supplemented by a short course of passive care.

* The use of a valid and reliable condition-specific instrument (e.g. Oswestry Disability Index) is encouraged but should not be used to measure overall recovery.

10.1.2 CARE PATHWAY FOR PERSISTENT NON-SPECIFIC LOW BACK PAIN (4 - 6 MONTHS POST-COLLISION)

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the non-specific low back pain care pathway.

Table 10.A Risk factors of serious pathology (red flags) for low back pain

Possible Cause	Risk factors of serious pathology identified during history or physical examination*
Cancer	• History of cancer • Unexplained weight loss • Nocturnal pain • Age > 50
Vertebral infection	• Fever • Intravenous drug use • Recent infection
Cauda equina syndrome	• Urinary retention • Motor deficits at multiple levels • Fecal incontinence • Saddle anesthesia
Osteoporotic fractures	• History of osteoporosis • Use of corticosteroid • Older age
Ankylosing spondylitis	• Morning stiffness • Improvement with exercise • Alternating buttock pain • Awakening due to back pain during the second part of the night • Younger age
Inflammatory arthritis	• Morning stiffness • Swelling in multiple joints

* Adapted from Chou et al. Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147:478-491.

If neurological signs related to a lumbar disc herniation with radiculopathy are present, the patient should be managed under the “Care Pathway for the Management of Lumbar Disc Herniation with Radiculopathy” (see section 10.2).

10.1.2 CARE PATHWAY FOR PERSISTENT NON-SPECIFIC LOW BACK PAIN (4 - 6 MONTHS POST-COLLISION)

Assess the Prognostic Factors

Assess the prognostic factors for delayed recovery. Most patients recover from their injury. Patients with the following prognostic factors may have a higher risk for delayed recovery*:

- Depression
- Passive coping strategies
- Job dissatisfaction
- High disability levels
- Disputed compensation claims
- Somatization

Educate and Reassure the Patient

Develop a patient-centred care plan in partnership with the patient.

Health care professionals need to reassure patients that there are no major structural or progressive pathologies (such as a fracture) in their back.

Prognostic factors for poor recovery should be addressed when present. The care should start with education and reassurance about the benign and self-limited nature of low back pain and the importance of maintaining activity and movement. This is particularly important when the patient reports poor expectation of recovery.

It is also important to reassure patients that it is normal to feel some anxiety, distress or anger following a traffic collision. In the presence of such symptoms or emotions, the health care professional should listen to the patient's concerns, discuss them and adjust the care plan accordingly.

Deliver the Care Plan for Persistent Non-specific Low Back Pain (4-6 months post-collision)

The goal of the care plan is to promote activity through exercise and clinical interventions that promote resolution of symptoms and restoration of function. Patients requiring clinical care should be encouraged to participate in their program of care by remaining active and returning to usual activities as tolerated.

Health care professionals should discuss treatment options with their patients and, through a process of shared decision making, determine which therapeutic option they wish to pursue. Based upon shared decision making between the patient and provider, any one of the following therapeutic interventions is recommended:

- Structured patient education
- Exercise
- Manipulation or mobilization
- Non-steroidal anti-inflammatory drugs

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* Chou et al. Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147:478-491

- Massage
- Acupuncture
- Multimodal care that includes the combination of exercise and cognitive/behavioural approaches for patients who have high levels of disability or significant distress

Interventions that are not recommended include:

- Passive physical modalities
- Botulinum toxin injections

Discuss the risks, benefits, and adverse effects of selected interventions in the care plan with the patient.

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered. Patients who have not recovered should follow the care pathway outlined in the guideline*.

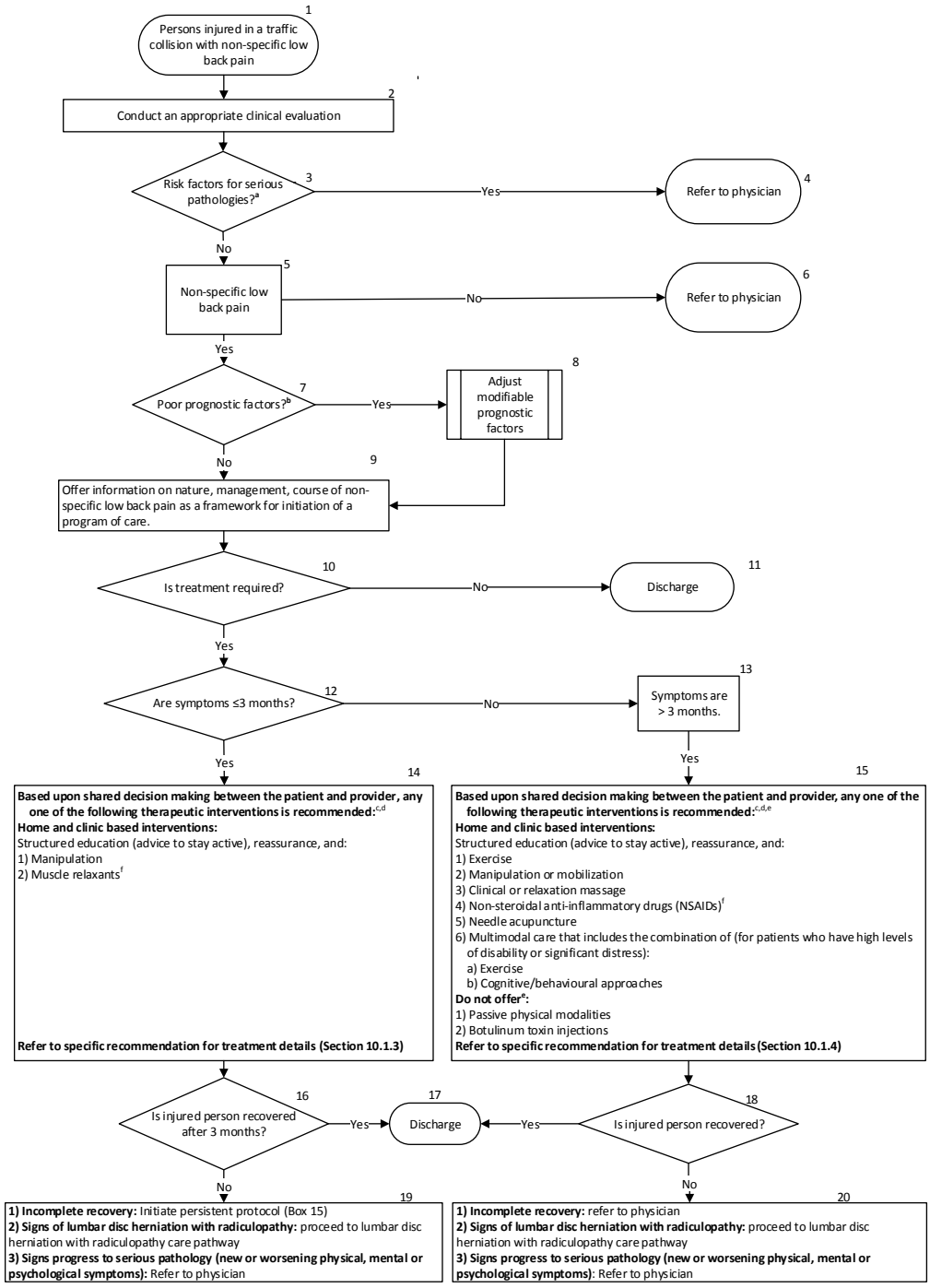
Patients who develop lumbar disc herniation with radiculopathy should be managed according to the care pathway for the management of lumbar disc herniation with radiculopathy (section 10.2).

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms (including lumbar disc herniation with radiculopathy) should be referred to their physician for further evaluation. Patients who have not significantly improved or recovered should be referred to the physician for further evaluation at any time point during their care.

* The use of a valid and reliable condition-specific instrument (e.g. Oswestry Disability Index) is encouraged but should not be used to measure overall recovery.

10.1.2 CARE PATHWAY FOR PERSISTENT NON-SPECIFIC LOW BACK PAIN (4 - 6 MONTHS POST-COLLISION)

Figure 10.1: Care Pathway for the Management of Non-specific Low Back Pain



[a] **Risk factors for serious pathologies (also known as red flags): Cancer (history of cancer, unexplained weight loss, nocturnal pain, age >50), vertebral infection (fever, intravenous drug use, recent infection), cauda equina syndrome (urinary retention, motor deficits at multiple levels, fecal incontinence, saddle anesthesia), osteoporotic fractures (history of osteoporosis, use of corticosteroid, older age), ankylosing spondylitis (morning stiffness, improvement with exercise, alternating buttock pain, awakening due to back pain during the second part of the night, younger age), inflammatory arthritis (morning stiffness, swelling in multiple joints)**

[b] **Factors delaying recovery: Depression, passive coping strategies, job dissatisfaction, high disability levels, disputed compensation claims, somatization**

[c] **This guideline does not include interventions for which there is a lack of evidence of effectiveness**

[d] **The ordering of interventions does not reflect superiority of effectiveness**

[e] **Based on evidence of no benefit to patients**

[f] **The evidence indicates that analgesia is the primary therapeutic benefit of the muscle relaxant and NSAID classes of medication. Pain reduction should be apparent during the initial period of usage; in the absence of therapeutic benefit, prolongation of usage is not warranted. There is no evidence of differential efficacy of the various drugs within each class. There is also no evidence that any combination of these medications provides added benefit. There are potentially significant adverse effects associated with use of these classes of medications Finally, the non-opioid first 'step' in the Analgesic Ladder includes NSAIDs, muscle relaxant, and acetaminophen (Vargas-Schaffer G. Is the WHO analgesic ladder still valid? Twenty four years of experience. Vol 56: June 2010 Canadian Family Physician). However, the evidence does not indicate that acetaminophen is an effective analgesic for either NAD or low back pain; therefore, the use of acetaminophen is not recommended.**

SECTION 10.1.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT ONSET NON-SPECIFIC LOW BACK PAIN

This section summarizes the key recommendations for the management of non-specific low back pain for the first 3 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movements.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 10.1.3.1

STRUCTURED PATIENT EDUCATION

Structured patient education aims to enable individuals to make informed decisions about their personal health-related behaviour. Structured education strategies refer to standardized interventions such as scripted discussion, pamphlets or videos. Educational interventions should begin with an assessment of the person's knowledge of the injury and their health goals. The content of the structured education interventions may include (but is not limited to): reassurance about the favourable prognosis of non-specific low back pain; advice on return to usual activities, including work; instruction of exercise; discussion of expected pain and pain mechanism; discussion of prognosis; pain coping skills; discussion of workplace ergonomics; and self-care strategies or general health.

Table 10.B: Structured patient education for recent onset non-specific low back pain

Recommendation 10.1.3.1.1	Provide information about the nature, management, and course of non-specific low back pain as a framework for the initiation of the program of care.
10.1.3.1.2	Consider a structured patient education program as an adjunct to an effective program of care based on individual patient presentation.*

References:

- Decision Determinants and Evidence Table for the Systematic Review of Low Back Pain Guidelines – Report 1 - Appendix 8

* The structured education program should focus on providing advice to stay active, returning to activities as tolerated, avoiding prescribed bed rest, reassuring the patient by addressing the expectation of recovery, and instruction on effective self-care options for pain management.

SECTION 10.1.3.2

MANUAL THERAPY

Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization and traction.

Table 10.C: Manual therapy for recent onset non-specific low back pain

Recommendation 10.1.3.2.1	Consider a maximum of seven sessions over one month of manipulation.*

References:

- Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A comparison of physical therapy, chiropractic manipulation, and provision of an educational booklet for the treatment of patients with low back pain. New Engl J Med 1998; 339(15): 1021-1029.
- Decision Determinants and Evidence Table for Low Back Pain Guidelines – Report 1 - Appendix 8

* Manipulation includes techniques incorporating a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion.

SECTION 10.1.3.3

▸ MEDICATION

Medications covered in this guideline include non-opioid analgesics (acetaminophen), non-steroidal anti-inflammatory drugs (NSAIDs), and muscle relaxants.

Table 10.D: Medication for recent onset non-specific low back pain

Recommendation 10.1.3.3.1	Consider muscle relaxants*
References: • Decision Determinants and Evidence Table for the Systematic Review on Muscle Relaxants for Neck Pain and Low Back Pain – Report 4 – Appendix 8 • Decision Determinants and Evidence Table for the Systematic Review of Non-opioid Analgesic Drugs for Neck and Low Back Pain – Report 2 - Appendix 8 • Decision Determinants and Evidence Table for the Systematic Review of Non-steroidal Anti-inflammatory Drugs for Neck and Low Back Pain – Report 3 - Appendix 8	

* The evidence indicates that analgesia is the primary therapeutic benefit of the muscle relaxant and NSAID classes of medication. Pain reduction should be apparent during the initial period of usage; in the absence of therapeutic benefit, prolongation of usage is not warranted. There is no evidence of differential efficacy for the various drugs within each class. There is also no evidence that any combination of these medications provides added benefit. There are potentially significant adverse effects associated with use of these classes of medications. Finally, the non-opioid first 'step' in the Analgesic Ladder includes NSAIDs, muscle relaxant and acetaminophen (Vargas-Schaffer G. Is the WHO analgesic ladder still valid? Twenty-four years of experience. Vol 56: June 2010 Canadian Family Physician). However, the evidence does not indicate that acetaminophen is an effective analgesic for either NAD or low back pain; therefore, the use of acetaminophen is not recommended.

SECTION 10.1.4

▸ KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT NON-SPECIFIC LOW BACK PAIN

This section summarizes the key recommendations for the management of non-specific low back pain for the period extending from 4 to 6 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

10.1.4 KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT NON-SPECIFIC LOW BACK PAIN

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movements.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 10.1.4.1

STRUCTURED PATIENT EDUCATION

Structured patient education aims to enable individuals to make informed decisions about their personal health-related behaviour. Structured education strategies refer to standardized interventions such as scripted discussion, pamphlets, or videos. Educational interventions should begin with an assessment of the person's knowledge of the injury and their health goals. The content of the structured education interventions may include (but is not limited to): reassurance about the favourable prognosis of non-specific low back pain; advice on return to usual activities, including work; instruction of exercise; discussion of expected pain and pain mechanism; discussion of prognosis; stress-coping skills; discussion of workplace ergonomics; and self-care strategies or general health.

Table 10.E: Structured patient education for persistent non-specific low back pain

Recommendation 10.1.4.1.1	Provide information about the nature, management, and course of non-specific low back pain as a framework for the initiation of the program of care.
10.1.4.1.2	Consider a structured patient education program as an adjunct to an effective program of care based on individual patient presentation.*
References: • Decision Determinants and Evidence Table for the Systematic Review of Low Back Pain Guidelines – Report 1 – Appendix 8	

* The structured education program should focus on providing advice to stay active, returning to activities as tolerated, reassuring the patient by addressing the expectation of recovery, brief educational interventions for short-term improvement, and instruction on effective self-care options for pain management.

SECTION 10.1.4.2

▸ EXERCISE

Exercise refers to any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health. Exercise therapy includes a wide variety of techniques common for the treatment and rehabilitation of non-specific low back pain.

Table 10.F: Exercise for persistent non-specific low back pain

Recommendation 10.1.4.2.1	Consider a maximum of eight sessions over 12 weeks of exercise (aerobic activity, movement instruction, muscle strengthening, postural control, or stretching). Consider a group of supervised exercise program, in a group of up to 10 people. A one-to-one supervised exercise program may be considered if a group program is not suitable for a particular person.
References: • Decision Determinants and Evidence Table for the Systematic Review of Low Back Pain Guidelines – Report 1 - Appendix 8	

SECTION 10.1.4.3

▸ MANUAL THERAPY

Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization and traction.

Table 10.G: Manual therapy for persistent non-specific low back pain

Recommendation 10.1.4.3.1	Consider a maximum of nine sessions over 12 weeks of manipulation* or mobilization**.
References: • Decision Determinants and Evidence Table for the Systematic Review of Low Back Pain Guidelines – Report 1 – Appendix 8	

* Manipulation includes techniques incorporating a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion.
** Mobilization refers to techniques incorporating a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion

SECTION 10.1.4.4

▸ SOFT TISSUE THERAPY

Soft tissue therapy is a mechanical therapy in which muscles, tendons, and ligaments are passively pressed or kneaded by hand or with mechanical devices. It includes relaxation massage, clinical massage, movement re-education, and energy work.

Table 10.H: Soft tissue therapy for persistent non-specific low back pain

Recommendation 10.1.4.4.1	Consider a maximum of ten sessions over ten weeks of clinical massage* or relaxation massage**.
References: • Decision Determinants and Evidence Table for the Systematic Review of Low Back Pain Guidelines – Report 1 – Appendix 8	

* Clinical massage refers to a group of soft tissue therapies that targets muscles with specific goals such as relieving pain, releasing muscle spasms or improving restricted motion. An example of clinical massage is myofascial trigger point therapy.
** Relaxation massage refers to a group of soft tissue therapies intended to relax muscles. Examples of relaxation massage techniques are effleurage, petrissage, and tapotement.

SECTION 10.1.4.5

▸ MEDICATION

Medications covered in this guideline include non-opioid analgesics (acetaminophen), non-steroidal anti-inflammatory drugs (NSAIDs), and muscle relaxants.

Table 10.I: Medication for persistent non-specific low back pain

Recommendation 10.1.4.5.1	Consider non-steroidal anti-inflammatory drugs*
10.1.4.5.2	Do not offer botulinum toxin injections

References:

- Decision Determinants and Evidence Table for the Systematic Review on Muscle Relaxants for Neck Pain and Low Back Pain – Report 4 – Appendix 8
- Decision Determinants and Evidence Table for the Systematic Review on Non-opioid Analgesic Drugs for Neck Pain and Low Back Pain – Report 2 – Appendix 8
- Decision Determinants and Evidence Table for the Systematic Review of Non-steroidal Anti-inflammatory Drugs for Neck and Low Back Pain Guidelines – Report 3 - Appendix 8

* The evidence indicates that analgesia is the primary therapeutic benefit of the muscle relaxant and NSAID classes of medication. Pain reduction should be apparent during the initial period of usage; in the absence of therapeutic benefit, prolongation of usage is not warranted. There is no evidence of differential efficacy for the various drugs within each class. There is also no evidence that any combination of these medications provides added benefit. There are potentially significant adverse effects associated with use of these classes of medications. Finally, the non-opioid first 'step' in the Analgesic Ladder includes NSAIDs, muscle relaxant and acetaminophen (Vargas-Schaffer G. Is the WHO analgesic ladder still valid? Twenty-four years of experience. Vol 56: June 2010 Canadian Family Physician). However, the evidence does not indicate that acetaminophen is an effective analgesic for either NAD or low back pain; therefore, the use of acetaminophen is not recommended.

SECTION 10.1.4.6

▸ ACUPUNCTURE

Acupuncture is a therapeutic technique that utilizes a thin metal needle to puncture the skin and stimulate specific points. Various acupuncture techniques exist, as well as the use of other types of stimulation in combination with or instead of a needle. Acupuncture interventions include body needling, moxibustion, electroacupuncture, laser acupuncture, microsystem acupuncture and acupressure.

Table 10.J: Acupuncture for persistent non-specific low back pain

Recommendation 10.1.4.6.1	Consider a maximum of 10 sessions over 12 weeks of needle acupuncture.

References:

- Decision Determinants and Evidence Table for the Systematic Review of Low Back Pain Guidelines – Report 1 – Appendix 8

SECTION 10.1.4.7

▸ MULTIMODAL CARE

Multimodal care includes at least two distinct therapeutic modalities, provided by one or more health care disciplines. The evidence suggests that two interventions should be included in multimodal care: exercise and cognitive/behavioural approaches.

Table 10.K: Multimodal care for persistent non-specific low back pain

Recommendation 10.1.4.7.1	For patients who have high levels of disability or significant distress, consider a maximum of 100 hours over a maximum of 8 weeks of multimodal care that combines exercise and cognitive/behavioural approaches.*
References: • Decision Determinants and Evidence Table for the Systematic Review of Low Back Pain Guidelines – Report 1 - Appendix 8	

* Patients with high levels of disability or significant distress include those who are on sick leave from work or cannot engage in normal activities of daily living. Exercises may include aerobic, stretching, and strengthening exercises.

SECTION 10.1.4.8

▸ PASSIVE PHYSICAL MODALITIES

Passive physical modalities include two categories of interventions: physico-chemical and structural. Physico-chemical modalities use a thermal or electromagnetic agent to affect the body at or beneath the skin level. Structural modalities include functional or non-functional assistive devices. Functional assistive devices intend to align, support or otherwise indirectly facilitate function in the affected region. Non-functional devices intend to achieve a state of rest in specific anatomic positions or prevent movement.

Table 10.L: Passive physical modalities for persistent non-specific low back pain

Recommendation 10.1.4.8.1	Do not offer passive physical modalities.*
References: • Decision Determinants and Evidence Table for the Systematic Review of Low Back Pain Guidelines – Report 1 - Appendix 8	

* Examples of passive physical modalities that are not recommended are transcutaneous electrical nerve stimulation (TENS), ultrasound, laser, and interferential therapy.

SECTION 10.2

MANAGEMENT OF LUMBAR DISC HERNIATION WITH RADICULOPATHY

Quick Reference Guide – Management of lumbar disc herniation with radiculopathy

Symptoms ≤ 3 months post-collision	Symptoms > 3 months post-collision
For all injured persons with lumbar disc herniation with radiculopathy: **Rule out** risk factors for serious pathologies[a] **Offer** information on nature, management, course of lumbar disc herniation with radiculopathy as a framework for initiation of a program of care **Conduct** ongoing assessment for symptom improvement or worsening/progression during intervention and refer accordingly **Reassess and Monitor** for presence of depression, passive coping strategies, job dissatisfaction, higher disability levels, disputed compensation claims, or somatization. **Discharge** injured person as appropriate at any point during intervention and recovery	
Based upon shared decision making between the patient and provider, the following therapeutic interventions are recommended:[b,c] **Home and clinic based interventions:** Structured education (advice to stay active), reassurance, and: 1. Manipulation for symptomatic relief **Refer to specific recommendation for treatment details (Section 10.2.3)**	**Refer to medical physician for consideration of further investigation of the neurological deficits.**
Outcome: **Recovered →** Discharge **Improvement (neurological signs no longer present) →** Refer to non-specific low back pain care pathway **Unrecovered:** **Incomplete recovery →** Initiate persistent protocol **Signs progress to serious pathology (new or worsening physical, mental or psychological symptoms) →** Refer to physician	

[a] Risk factors for serious pathologies (also known as red flags): Cancer (history of cancer, unexplained weight loss, nocturnal pain, age >50), vertebral infection (fever, intravenous drug use, recent infection), cauda equina syndrome (urinary retention, motor deficits at multiple levels, fecal incontinence, saddle anesthesia), osteoporotic fractures (history of osteoporosis, use of corticosteroid, older age), ankylosing spondylitis (morning stiffness, improvement with exercise, alternating buttock pain, awakening due to back pain during the second part of the night, younger age), inflammatory arthritis (morning stiffness, swelling in multiple joints)
[b] This guideline does not include interventions for which there is a lack of evidence of effectiveness
[c] The ordering of interventions does not reflect superiority of effectiveness

SECTION 10.2.1

CARE PATHWAY FOR RECENT ONSET LUMBAR DISC HERNIATION WITH RADICULOPATHY (0-3 MONTHS POST-COLLISION)

The care pathway is presented in Figure 10.2.

At initial contact, health care professionals should educate and reassure the patient that back and leg pain will resolve within a few months of symptom onset. Patients greatly improve their recovery by actively engaging in their care. Clinical care aims to accelerate recovery by reducing pain and improving function. The care pathway recommended for the first 3 months of care for lumbar disc herniation with radiculopathy is described below.

Patients who still suffer from neurological signs after 3 months of care should be referred to their physician for further evaluation.

Assess the Patient

Conduct an appropriate clinical evaluation to rule out major structural or other pathologies as the cause of the

symptoms. The presence of a risk factor for serious pathologies (also known as red flags) identified during the history and examination warrants further investigation and referral to the appropriate health care professional. However, once pathology has been ruled out, the patient should be treated according to the lumbar disc herniation with radiculopathy clinical pathway.

Table 10.A Risk factors of serious pathology (red flags) for low back pain

Possible Cause	Risk factors of serious pathology identified during history or physical examination*
Cancer	• History of cancer • Unexplained weight loss • Nocturnal Pain • Age > 50
Vertebral infection	• Fever • Intravenous drug use • Recent infection
Cauda equina syndrome	• Urinary retention • Motor deficits at multiple levels • Fecal incontinence • Saddle anesthesia
Osteoporotic fractures	• History of osteoporosis • Use of corticosteroid • Older age
Ankylosing spondylitis	• Morning stiffness • Improvement with exercise • Alternating buttock pain • Awakening due to back pain during the second part of the night • Younger age
Inflammatory arthritis	• Morning stiffness • Swelling in multiple joints

* Adapted from Chou et al. Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147:478-491.

10.2.1 CARE PATHWAY FOR RECENT ONSET LUMBAR DISC HERNIATION WITH RADICULOPATHY (0-3 MONTHS POST-COLLISION)

Assess neurological signs (decreased deep tendon reflexes, muscle weakness, or sensory deficits).

Patients without neurological signs should be managed under the care pathways for the management of non-specific low back pain (see section 10.1)

Educate and Reassure the Patient

Develop a patient-centred care plan in partnership with the patient.

Health care professionals need to reassure patients that there are no major structural or progressive pathologies (such as a fracture) in their back.

Prognostic factors for poor recovery should be addressed when present. The care should start with education and reassurance about the benign and self-limited nature of most lumbar disc herniation with radiculopathy and the importance of maintaining activity and movement. This is particularly important when the patient reports poor expectation of recovery.

It is also important to reassure patients that it is normal to feel some anxiety, distress or anger following a traffic collision. In the presence of such symptoms or emotions, the health care professional should listen to the patient's concerns, discuss them and adjust the care plan accordingly.

Deliver the Clinical Care for Recent Onset Lumbar Disc Herniation with Radiculopathy (0-3 months post-collision)

The goal of the care plan is to promote activity and clinical interventions that promote resolution of symptoms and restoration of function. Based upon shared decision making between the patient and provider, the following therapeutic interventions are recommended:

- Structured patient education
- Spinal manipulation

Reassess and Take the Indicated Course of Action

Reassess the patient at every visit to determine if additional care is necessary, or if the condition is worsening.

Patients should be discharged as soon as they report significant improvement or recovery. It is recommended that health care professionals use the self-rated recovery question to measure patient recovery: "How well do you feel you are recovering from your injuries?" The response options include: 1) completely better, 2) much improved, 3) slightly improved, 4) no change, 5) slightly worse, 6) much worse, and 7) worse than ever. Patients reporting to be 'completely better' or 'much improved' should be considered recovered. Patients who have not recovered should follow the care pathway outlined in the guideline*.

Patients who improve and no longer report leg pain but still experience back pain should be managed according to the care pathways for the management of non-specific low back pain (section 10.1)

* The use of a valid and reliable condition-specific instrument (e.g. Oswestry Disability Index) is encouraged but should not be used to measure overall recovery.

10.2.1 CARE PATHWAY FOR RECENT ONSET LUMBAR DISC HERNIATION WITH RADICULOPATHY (0-3 MONTHS POST-COLLISION)

Patients with worsening of symptoms and those who develop new physical, mental or psychological symptoms should be referred to their physician for further evaluation at any time point during their care.

Patients who still suffer from neurological signs after the first 3 months of care should be referred to their physician for further evaluation.

SECTION 10.2.2

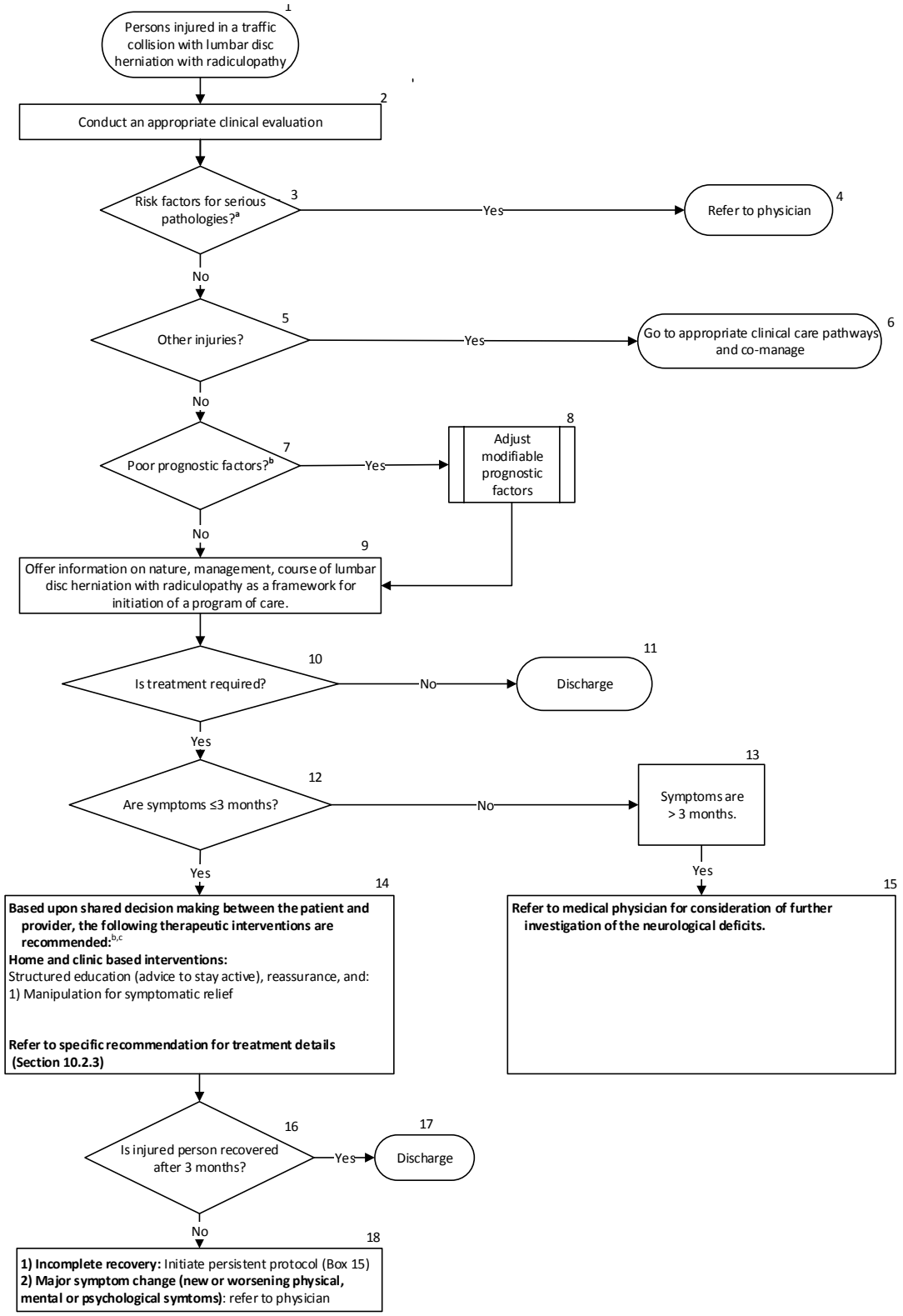
CARE PATHWAY FOR PERSISTENT LUMBAR DISC HERNIATION WITH RADICULOPATHY (4-6 MONTHS POST-COLLISION)

The care pathway is presented in Figure 10.2.

Patients who still suffer from neurological signs after the first 3 months of care should be referred to their physician for further evaluation.

10.2.2 CARE PATHWAY FOR PERSISTENT LUMBAR DISC HERNIATION WITH RADICULOPATHY (4-6 MONTHS POST-COLLISION)

Figure 10.2: Care Pathway for the Management of Lumbar Disc Herniation with Radiculopathy



[a] **Risk factors for serious pathologies (also known as red flags): Cancer (history of cancer, unexplained weight loss, nocturnal pain, age >50), vertebral infection (fever, intravenous drug use, recent infection), cauda equina syndrome (urinary retention, motor deficits at multiple levels, fecal incontinence, saddle anesthesia), osteoporotic fractures (history of osteoporosis, use of corticosteroid, older age), ankylosing spondylitis (morning stiffness, improvement with exercise, alternating buttock pain, awakening due to back pain during the second part of the night, younger age)**

[b] **Unlisted interventions are not recommended due to lack of admissible quality of evidence to make an informed decision**

[c] **The ordering of interventions does not reflect superiority of effectiveness**

SECTION 10.2.3

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF RECENT ONSET LUMBAR DISC HERNIATION WITH RADICULOPATHY

This section summarizes the key recommendations for the management of recent onset lumbar disc herniation with radiculopathy for the first 3 months post-collision. The wording of recommendations follows the guidance from the National Institute for Health and Care Excellence (NICE). Recommendations beginning with "offer" indicate that, according to the evidence, an intervention is associated with outcomes that were superior to other interventions, placebo/sham, or no intervention. The wording "consider" indicates that an intervention is as effective as another one. The wording "do not offer" indicates that, according to the evidence, an intervention does not benefit patients. A detailed explanation of the wording of recommendations is presented in section 2.5.2.4 of this report.

- Provide care in partnership with the patient. Involve the patient in care planning and decision-making.
- Reassure patients about the benign and self-limited nature of their pain.
- Educate patients about the benefits of being actively engaged and participating in their care plan by remaining active and continuing movement.
- Emphasize active rather than passive treatments.
- Deliver time-limited care.
- Do not provide ineffective or experimental treatments.

SECTION 10.2.3.1

STRUCTURED PATIENT EDUCATION

Structured patient education aims to enable individuals to make informed decisions about their personal health-related behaviour. Structured education strategies refer to standardized interventions such as scripted discussion, pamphlets or videos. Educational interventions should begin with an assessment of the person's knowledge of the injury and their health goals. The content of the structured education interventions may include (but is not limited to): reassurance about the favourable prognosis of lumbar disc herniation with radiculopathy; advice on return to usual activities, including work; instruction of exercise; discussion of expected pain and pain mechanism; discussion of prognosis; stress-coping skills; discussion of workplace ergonomics; and self-care strategies or general health.

Table 10.M: Structured patient education for recent onset lumbar disc herniation with radiculopathy

Recommendation 10.2.3.1.1	Provide information about the nature, management, and course of lumbar disc herniation with radiculopathy as a framework for the initiation of the program of care.
10.2.3.1.2	Consider a structured patient education program as an adjunct to an effective program of care based on individual patient presentation.*
References: • Decision Determinants and Evidence Table for the Systematic Review of Low Back Pain Guidelines – Report 1 - Appendix 8	

* The structured education program should focus on providing advice to stay active and reassuring the patient by addressing the expectation of recovery.

SECTION 10.2.3.2

MANUAL THERAPY

Manual therapy refers to techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization and traction.

Table 10.N: Manual therapy for recent onset lumbar disc herniation with radiculopathy

Recommendation 10.2.3.2.1	Consider a maximum of 20 sessions over 6 weeks of manipulation for symptomatic relief.*
References: • Decision Determinants and Evidence Table for the Systematic Review of Low Back Pain Guidelines – Report 1 - Appendix 8	

* Manipulation includes techniques incorporating a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion.

SECTION 10.2.4

KEY RECOMMENDATIONS FOR THE MANAGEMENT OF PERSISTENT LUMBAR DISC HERNIATION WITH RADICULOPATHY

- Patients who still suffer from neurological deficits three months after their injury should be referred to their physician for further evaluation.

GLOSSARY

GLOSSARY

Acetaminophen	A type of analgesic drug.
Acupuncture	Acupuncture interventions are defined in accordance with the World Health Organization as body needling (traditional, medical, modern, dry needling, trigger point needling, etc.), moxibustion (burning of herbs), electroacupuncture, laser acupuncture, microsystem acupuncture (such as ear acupuncture), and acupressure (application of pressure at acupuncture points).
Adductor-related groin pain	Groin pain with pressure applied to the tendons of the muscles on the inside of the thigh (adductors), groin pain with resisted contraction of the adductors
Adequate methodological quality (for studies)	Studies with a low risk of bias as identified by the Scottish Intercollegiate Guidelines Network (SIGN) checklist. http://www.sign.ac.uk/methodology/checklists.html.
Adequate methodological quality (for guidelines)	Low risks of bias in the methodology of guideline development, as identified by the Appraisal of Guidelines for Research and Evaluation (AGREE) II instrument. http://www.agreetrust.org/resource-centre/agree-ii
Anti-inflammatory diet	A diet that would consist of fish, soybeans, cherries, berries, fruits, vegetables, nuts and whole grains, and a decrease of alcohol consumption.
Cervical collar	A device worn by the patient and used to immobilize the neck.
Cervicogenic headache	Headache referred from the neck and felt in one or more regions of the head and/or face, as defined by the International Classification of Headache Disorders (ICHD) http://ihsclassification.org/en/02_klassifikation/03_teil2/11.02.01_cranial.html
Chronic tension-type headache	Headaches occurring on 15 or more days per month for more than 3 months and fulfilling other criteria from the International Classification of Headache Disorders (ICHD) http://ihsclassification.org/en/02_klassifikation/02_teil1/02.00.00_tension.html
Clinical massage	Soft tissue therapies intended to target muscles with specific goals such as relieving pain, releasing muscle spasms or improving restricted motion, performed by a practitioner.

GLOSSARY

Clinical practice guideline	A systematically developed statement that aims to assist clinicians in providing quality care to patients.
Cognitive behavioural therapy	A therapy that is used to help people think in a healthy way with a focus on thought (cognitive) and action (behavioral).
Corticosteroid	Class of medications that reduce inflammation.
Cryotherapy	The local use of low temperatures (e.g., ice).
Cupping massage	A form of massage which utilizes cupping glasses being moved over the skin once suction (negative pressure) is created. The aim is to increase local blood circulation and relieve muscle tension.
Diacutaneous Fibrolysis	Application of a metal hook-based instrument as deeply as possible to the intermuscular septum between muscles with the aim of releasing tissue adherences to treat mechanical or inflammatory pain in the musculoskeletal system.
Dynamic muscle training	Exercises using dumbbells with the aim of activating large muscle groups in the neck and shoulder region.
Efficacy	The ability of an intervention to produce a desired or intended result (exploratory study).
Effectiveness	The degree to which an intervention is successful in producing a desired result.
Electric Muscle Stimulation (EMS)	A passive physical modality that stimulates muscle contraction by electrical impulses.
Electroacupuncture	The stimulation of inserted acupuncture needles with an electrical current. The frequency and intensity of the electrical stimulation may vary.
Epicondylitis	Epicondylitis is a painful condition affecting the elbow. It is commonly associated with pain or burning at the inner or outer part of the elbow, pain in the forearm muscles and weak grip strength.

GLOSSARY

Episodic tension-type headache	Headaches with at least 10 episodes occurring on 1 to 15 days per month for at least 3 months and fulfilling other criteria from the International Classification of Headache Disorders (ICHD) http://ihsclassification.org/en/02_klassifikation/02_teil1/02.00.00_tension.html
Exercise	Any series of movements with the aim of training or developing the body by routine practice or as physical training to promote good physical health.
General exercise program	An exercise program incorporating aerobic exercises, stretching, strengthening, endurance, co-ordination and functional activities for the whole body.
Guided imagery	A technique used to induce relaxation. Recordings are designed to help individuals visualize themselves relaxing or engaging in positive changes or actions. State of awareness is similar to that of a meditative status.
Headache attributed to whiplash injury	Headache that develops after a whiplash injury to the neck, as defined by the International Classification of Headache Disorders (ICHD, http://ihs-classification.org/en/02_klassifikation/03_teil2/05.03.00_necktrauma.html, June 2013).
High-intensity strengthening	A strengthening program where load is gradually increased over the duration of the program, while repetitions are decreased.
Interferential current therapy	Interferential current therapy produces current to selectively excite large diameter nerve fibres and temporarily inhibit transmission of nociceptive signals in the spinal dorsal horn from pain mediating small diameter nerve fibres.
Inversion ankle sprain	The most common type of ankle sprain involving tearing of the ligaments on the outside of the ankle.
Ischemic compression	A soft tissue therapy that involves sustained pressure to a muscle that is applied with the hand or a device, performed by a health care professional.
Iyengar yoga	Range of classical yoga poses adapted with the use of modified poses or supportive props for individuals with specific health issues.

Kinesio tape	A thin, pliable adhesive tape applied to the skin.
Lateral epicondylitis	Pain at the outside of the elbow and in the upper forearm where the muscle tendon attaches to the bone (also known as tennis elbow).
Local microwave diathermy	Local microwave diathermy is a device which induces hyperthermia on deep tissue.
Low-grade nonspecific shoulder pain	Diffuse pain over the shoulder joint and/or upper arm that is exacerbated by shoulder movements. The pain intensity is less than 3/10 in intensity.
Lower extremity disorders	Involves grade I and II sprains or strains of the hip, thigh, knee, leg, ankle, and foot.
Low-Level Laser Therapy (LLLT)	Application of a coherent light beam (laser) to a region for the purpose of reducing local pain or promoting local healing.
Low load endurance exercise	Exercises intended to strengthen the muscles against resistance.
Manipulation	Manual treatment applied to the spine or joints of the upper or lower extremity that incorporates a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion.
Manual or mechanically assisted traction	A manual or mechanically assisted application of an intermittent or continuous distractive force.
Manual therapy	Techniques that involve the application of hands-on and/or mechanically assisted treatments, including manipulation, mobilization, and traction.
Massage	A group of soft tissue therapies intended to target muscles for the purpose of specific goals and relax muscles
Mild Traumatic Brain Injury (MTBI)	An acute brain injury resulting from mechanical energy to the head from external physical forces* *Cancelliere C, Cassidy JD, Côté P, et al. Protocol for a systematic review of prognosis after mild traumatic brain injury: an update of the WHO Collaborating Centre Task Force findings. Syst Rev 2012;1:17.

Mobilization	Manual treatment applied to the spine or joints of the upper or lower extremity that incorporates a low velocity and small or large amplitude oscillatory movement, within a joint's passive range of motion.
Multimodal care	Treatment involving at least two distinct therapeutic modalities, provided by one or more health care disciplines. The following were considered distinct therapeutic modalities: passive physical modalities; exercise; manual therapy which includes mobilization, manipulation or traction; acupuncture; education; psychological interventions; and soft tissue therapies.
Multimodal rehabilitation (combined physical and psychological treatment)	A treatment approach that combines physical (e.g., exercise) and psychological treatment (e.g., cognitive behavioural approaches)
Muscle energy technique	A soft tissue therapy performed by a health care professional that involves a stretch to the muscle after the muscle was contracted against resistance.
Muscle relaxants	A broad range of drugs with different chemical structures and mechanisms of action, which fall into three groups according to their actions along the voluntary motor control – skeletal muscle axis: 1) muscle decoupler; 2) neuromuscular blockers; and 3) spasmolytics.
Musculoskeletal chest wall pain	Pain reported in the anterior and posterolateral chest wall (region bounded superiorly by the thoracic outlet, inferiorly by the diaphragmatic margin, and lateral to the most lateral margins of the erector spinae muscles).
Musculoskeletal thoracic spine pain	Pain reported within the region bounded superiorly by the first thoracic spinous process, inferiorly by the last thoracic spinous process, and by the most lateral margins of the erector spinae muscles.
Myofascial Release Therapy	A soft-tissue therapy aimed at relaxing contracted muscles and improving blood and lymph circulation in associated tissues. It uses slow and sometimes deep pressure applied directly to tissues.
Naprapathy	A combination of manual techniques (such as massage, muscle stretching, spinal manipulation and spinal mobilization) used to increase physical function and decrease pain in the neuromusculoskeletal system.

Needle acupuncture	A medical technique that utilizes thin metal needles to puncture the skin at pre-specified local and distant points.
Non-invasive interventions	Non-invasive interventions include any form of treatment considered to be non- or minimally invasive and involve any non-surgical treatment options.
Nonspecific shoulder pain	Diffuse pain over the shoulder joint and/or upper arm that is exacerbated by shoulder movements.
Non-penetrating	Does not puncture the skin.
Non-steroidal Anti-inflammatory Drugs (NSAIDs)	A class of drugs that helps to reduce inflammation and pain.
Occlusal device	When used for temporomandibular disorders, this is a flat splint that covers all teeth, usually used to prevent clenching and/or bruxism.
Passive physical modalities	Physical modalities or devices that do not require the active participation of patients (including rest). These are divided into two categories: physico-chemical and structural. Physico-chemical modalities use thermal or electromagnetic effect, such as cold, heat or light application at the skin level, or light, ultrasonic or electromagnetic radiation affecting structures beneath the skin. Structural modalities include non-functional assistive devices that encourage rest in anatomic positions or actively inhibit or prevent movement and functional assistive devices that align, support or indirectly facilitate function in the affected region.
Patellofemoral pain syndrome	Anterior knee pain aggravated by walking up/down stairs, squatting, running, cycling or prolonged sitting.
Patient education	A process to enable individuals to make informed decisions about their personal health-related behaviour.
Persistent	Symptom duration of greater than three months.
Placebo	A simulated or otherwise ineffective treatment intended to deceive the recipient. In double blinded experiments there is intention to deceive both recipient and treatment administrator.

Pre-tensioned tape	Tape is pre-tensioned prior to application on subjects and the subjects maintain the required postural changes while tape is applied.
Primary care	Intended to meet the needs of most patients with regards to treatment, care, preventive measures and rehabilitation.
Physiotherapy	The Ontario Regulated Health Professions Act, 1991 defines the practice of physiotherapy as described in the Physiotherapy Act, 1991: "The practice of physiotherapy is the assessment of neuromuscular, musculoskeletal and cardio respiratory systems, the diagnosis of diseases or disorders associated with physical dysfunction, injury or pain and the treatment, rehabilitation and prevention or relief of physical dysfunction, injury or pain to develop, maintain, rehabilitate or augment function and promote mobility."
Progressive goal attainment program	A standardized intervention used to increase daily activities and address psychosocial issues considered barriers to recovery following a musculoskeletal injury.
Phlogenzym	A proteolytic enzyme of 90 mg of bromeleain, 48 mg of trypsin and 100 mg of rutin.
Psychological interventions	Generic term for methods used to treat emotional disturbances or mental illness primarily by verbal or non-verbal communication. These interventions could either be led by a health care provider over one or more sessions, including in-person psychoeducation, or be delivered using a booklet/written material with a psychoeducation component, internet interventions or guided psychological self-help interventions.
Qigong	Gentle, focused exercises for mind and body to increase and restore the flow of qi energy and encourage healing. http://oxfordmedicine.com/view/10.1093/med/9780199206773.001.0001/med-9780199206773-chapter-3#med-9780199206773-div1-39, August 2013)
Radiculopathy	A condition involving the nerve root(s) with symptoms of pain, numbness, and/or weakness in the muscles.
Recent-onset	Symptom duration of three months or less.
Relaxation massage	A group of soft tissue therapies intended to relax muscles, performed by a practitioner.

Relaxation training	Used to guide individuals to relax muscles not needed for various daily Activities. This may include progressive relaxation training (different muscle groups are systematically tensed and relaxed) or autogenic relaxation training (self-control of the body's physiological reactions).
Routine medical care	Conventional medical treatments with the exception of acupuncture.
Self-care management	Structured self-care management involving distribution of information about temporomandibular disorders and a patient manual on general health information (e.g. pain medications, communicating with health care providers, and making treatment decisions).
Sham	A procedure that is similar to the treatment under investigation, but omits the therapeutic element of that treatment.
Shock-wave therapy	A passive physical modality that is placed onto the skin; it involves acoustic waves associated with a sudden rise in pressure and are generated by electrohydraulic, piezoelectric and electromagnetic devices to send sound waves into areas of soft tissue.
Short term	Less than three months.
Shoulder	Consists of the clavicle and the scapula that attach the upper limbs to the axial skeleton by a ligament system called the shoulder capsule, the rotator cuff muscles and the muscles of the upper back. The shoulder girdle forms an incomplete circle that allows for maximal flexibility of the upper limbs in all planes.
Soft tissue injuries	Soft tissue injuries include but are not limited to grade I-II sprains/strains, tendonitis, tendinopathy, tendinosis, and non-specific diffuse pain.
Soft tissue therapy	A mechanical therapy in which muscles, tendons, and ligaments are passively pressed and kneaded by hand or with mechanical devices.
Spinal manipulation	Manual therapy applied to the spine that involves a high velocity, low amplitude impulse or thrust applied at or near the end of a joint's passive range of motion.

Strain-counterstrain	A soft tissue therapy that involves applied pressure to a muscle with positioning of the neck to provide a small stretch a muscle, performed by a practitioner.
Structured patient education	A structured, standardized and condition-specific patient education intervention which can be differentiated from the usual clinical education routinely provided by clinicians in the course of clinical care by its structured nature (e.g. pamphlets, videos, structured consultation).
Subacromial decompression surgery	Removal of the bursa with partial resection of the antero-inferior part of the acromion and the coracoacromial ligament.
Subacromial impingement syndrome/ subacromial syndrome	A clinical syndrome that occurs when the tendons of the rotator cuff become irritated as they pass beneath the acromion (bone in the shoulder). This results in pain and weakness, particularly with overhead use of the shoulder.
Supervised exercise	An exercise program supervised by practitioners.
Supervised graded neck strengthening	Graded activity exercises to strengthen the superficial and deep neck muscles
Surface electromyelogram (EMG) biofeedback	Used to improve muscle awareness and control during activities and assist with relaxation and coping skills. It provides instant feedback of myoelectric activity and can be implemented as a cognitive or educational tool to help control muscle responses.
Systematic review	A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyze data from the studies that are included in the review (PRISMA, http://www.prisma-statement.org/statement.htm, May 2013)
Tension-type headache	Headache with most of the following characteristics: 1) felt on both sides of the head; 2) pressing, tightening, or non-pulsating quality; 3) mild or moderate intensity; and 4) not worsened with routine activities, as defined by the International Classification of Headache Disorders (ICHD, http://ihs-classification.org/en/02_klassifikation/02_teil1/02.00.00_tension.html, June 2013)

Temporomandibular disorders	Also known as craniomandibular disorders, involve a group of pathologies that affect the masticatory muscles, the temporomandibular joint (TMJ), and surrounding structures and include sprain and strain injuries (Canadian Dental Association, http://www.cda-adc.ca/en/oral_health/complications/temporomandibular_disorder/, May 2013).
Traction	Manual or mechanically assisted application of an intermittent or continuous distractive force.
Transcutaneous Electrical Nerve Stimulation (TENS)	A passive physical modality connected to the skin, using two or more electrodes to apply low level electrical current. Typically used with the intent to help pain management.
Trigger point therapy	A form of clinical massage where pressure and/or longitudinal stroking is applied over a trigger point in a muscle.
Ultrasound	Ultrasound is an oscillating sound pressure wave affecting structures beneath the skin surface.
Upper extremity disorders	Involves grade I and II sprains or strains of the shoulder, arm, elbow, forearm, wrist, and hand, as well as nerve entrapment syndromes such as carpal tunnel syndrome.
Variable duration	Refers to the combination of recent-onset and persistent duration.
Yoga	An ancient Indian practice involving postural exercises, breathing control, and meditation. http://oxfordmedicine.com/view/10.1093/med/9780199206773.001.0001/med-9780199206773-chapter-3#med-9780199206773-div1-47