

## SUPPLEMENTARY MATERIAL 1 – SEARCH STRATEGIES

### MEDLINE (via PubMed)

("Neck Pain"[MeSH Terms] OR "Neck Pain"[Title/Abstract] OR "cervical pain"[Title/Abstract] OR "neckache\*"[Title/Abstract] OR "neck ache\*"[Title/Abstract] OR "cervicodynia"[Title/Abstract] OR "cervical vertebrae"[Title/Abstract] OR "cervical spine"[Title/Abstract] OR "cervico\*"[Title/Abstract] OR whiplash[Title/Abstract] OR "Radiculopathy"[Mesh] OR "Cervical radiculopathy"[Title/Abstract] OR "Post-Traumatic Headache"[Mesh]) AND ("guideline\*"[Title/Abstract] OR "Guideline" [PT] OR "Guidelines as Topic"[Majr] OR Consensus Development Conference [PT])

### EMBASE

('Neck Pain'/exp OR 'Neck Pain':ti,ab OR 'cervical pain':ti,ab OR neckache\*:ti,ab OR 'neck ache\*:ti,ab OR cervicodynia:ti,ab OR 'cervical vertebrae':ti,ab OR 'cervical spine':ti,ab OR cervico\*:ti,ab OR whiplash:ti,ab OR Radiculopathy/exp OR 'Cervical radiculopathy':ti,ab OR 'Post-Traumatic Headache'/exp) AND ('guideline\*':ti OR ((practice\* OR clinic\*) NEAR/2 guideline\*):ti,ab OR 'practice guideline'/exp OR 'consensus development'/exp)

## SUPPLEMENTARY MATERIAL 2 – REFERENCE TO THE INCLUDED GUIDELINES

FIRST AUTHOR AND YEAR	TITLE
Albright, 2001 <sup>1</sup>	Philadelphia Panel Evidence-Based Clinical Practice Guidelines on Selected Rehabilitation Interventions for Neck Pain
Bekkering, 2003 <sup>2</sup>	Clinical practice guidelines for physical therapy in patients with whiplash-associated disorders
Bier, 2018 <sup>3</sup>	Clinical Practice Guideline for Physical Therapy Assessment and Treatment in Patients With Nonspecific Neck Pain
Blanpied, 2017 <sup>4</sup>	Neck Pain: Revision 2017 - Clinical Practice Guidelines Linked to the International Classification of Functioning, Disability and Health From the Orthopaedic Section of the American Physical Therapy Association
Bono, 2011 <sup>5</sup>	An evidence-based clinical guideline for the diagnosis and treatment of cervical radiculopathy from degenerative disorders
Brosseau, 2012 <sup>6</sup>	Ottawa panel evidence-based clinical practice guidelines on therapeutic massage for neck pain
Bussi�eres, 2016 <sup>7</sup>	The Treatment of Neck Pain–Associated Disorders and Whiplash-Associated Disorders: A Clinical Practice Guideline
Cot�e, 2016 <sup>8</sup>	Management of neck pain and associated disorders: A clinical practice guideline from the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration
Chu, 2017 <sup>9</sup>	Clinical practice guidelines of acupuncture-moxibustion for cervical spondylotic radiculopathy
Gonzalez Ramirez, 2005 <sup>10</sup>	Clinical guidelines for the rehabilitation of the patient with cervical sprain, at the first level of care.
Gross, 2002 <sup>11</sup>	Clinical practice guideline on the use of manipulation or mobilization in the treatment of adults with mechanical neck disorders
Hurley, 2021 <sup>12</sup>	Consensus practice guidelines on interventions for cervical spine (facet) joint pain from a multispecialty international working group
Karpinnen, 2017 <sup>13</sup>	Neck pain (adults)
Lang, 2007 <sup>14</sup>	Sprain and strain of the cervical spine
Latka, 2015 <sup>15</sup>	Treatment of degenerative cervical spondylosis with radiculopathy. Clinical practice guidelines endorsed by The Polish Society of Spinal Surgery
Lee, 2021 <sup>16</sup>	An evidence-based approach for the development of a clinical practice guideline for the treatment of neck pain using traditional Korean medicine
Leigh, 2005 <sup>17</sup>	Clinical Practice Guidelines for Physiotherapy Management of Patients with Whiplash Associated Disorders
Lemeunier, 2017 <sup>18</sup>	Assessment of the patient with neck pain and decision-making chiropractic therapeutics

Monticone, 2013 <sup>19</sup>	The Italian Society of Physical and Rehabilitation Medicine (SIMFER) recommendations for neck pain
Moore, 2005 <sup>20</sup>	Clinical guidelines for the physiotherapy management of Whiplash Associated Disorders
Papic, 2023 <sup>21</sup>	Australian Clinical Guidelines for Health Professionals Managing People with Whiplash-Associated Disorders, Fourth Edition
Pohl, 2018 <sup>22</sup>	Cervical radiculopathy
Scherer, 2016 <sup>23</sup>	Neck pain
State of Colorado, 2022 <sup>24</sup>	Cervical Spine Injury - Medical Treatment Guidelines
Sterling, 2008 <sup>25</sup>	Clinical guidelines for best practice management of acute and chronic whiplash-associated disorders
Sundhedsstyrelsen, 2018 <sup>26</sup>	National clinical guideline for the non-surgical treatment of new-onset root involvement in the neck with radiating symptoms to the arm (cervical radiculopathy)
Sundhedsstyrelsen, 2010 <sup>27</sup>	National clinical guideline for non-surgical treatment of new-onset non-specific neck pain
Whalen, 2019 <sup>28</sup>	Best-Practice Recommendations for Chiropractic Management of Patients With Neck Pain
Xiao, 2021 <sup>29</sup>	Expert panel's guideline on cervicogenic headache: The Chinese Association for the Study of Pain recommendation

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## SUPPLEMENTARY MATERIAL 3

## CHARACTERISTICS OF THE GUIDELINES WITH DIAGNOSTIC RECCOMANDATIONS, BUT NO RED FLAGS RECCOMANDATIONS

Author and year	Nation	Language	Society	Population (as reported in the guideline)
State of Colorado, 2022	USA	English	Department of Labor and Employment	Neck pain
Hurley, 2021	USA	English	American Academy of Pain Medicine and American Society of Regional Anesthesia and Pain Medicine	Cervical spine facet joint pain
Xiao, 2021	China	English	Chinese Association for the Study of Pain	Cervicogenic headache
Pohl, 2018	Germany	German	German Society for Neurology	Degenerative Cervical radiculopathy
Chu, 2017	China	English	China Association of Acupuncture-moxibustion	Cervical Spondylotic Radiculopathy
Bekkering, 2003	Netherlands	English	Royal Dutch Society for Physical Therapy (KNGF)	Whiplash-associated disorders
Bono, 2011	USA	English	North American Spine Society	Cervical radiculopathy
Lang, 2007	Germany	German	Several specialist German societies	WAD
Gonzalez Ramirez, 2005	Mexico	Spanish	Mexican Social Security Institute	WAD
Leigh, 2005	Canada	English	Physiotherapy Association of British Columbia	WAD grades I to III

WAD: Whiplash and associated disorders

## CHARACTERISTICS OF THE GUIDELINES WITHOUT DIAGNOSTIC RECOMMENDATIONS

Author and year	Nation	Language	Society	Population (as reported in the guideline)
Lee, 2021	South Korea	English	The Society of Korean Medicine Rehabilitation	Neck pain
Sundhedsstyrelsen, 2020	Denmark	Danish	Danish Health Authority	Non – specific neck pain
Sundhedsstyrelsen, 2018	Denmark	Danish	Danish Health Authority	Cervical radiculopathy
Latka, 2015	Poland	English	Polish Society of Spinal Surgery	Degenerative cervical spondylosis with radiculopathy
Brosseau, 2012	Canada	English	Ottawa Panel	Mechanical neck pain, neck pain with headache, neck pain with radicular findings
Gross, 2002	Canada	English	College of Physiotherapists of Ontario	Mechanical neck disorders, neck disorders with headache of cervical origin and neck disorders with radicular signs or symptoms
Albright, 2001	USA	English	Philadelphia Panel	Non-specific neck pain

TABLE WITH THE RED FLAGS RECOMMENDED BY CLINICAL PRACTICE GUIDELINES

Red flag	Guideline	Level of evidence underpinning the recommendations with references cited by the guideline	Diagnostic accuracy values	Reported literature underpinning the red flag recommendation
<b>FRACTURES (Number of guidelines = 7, Red flags = 14)</b>				
<b>Positive Canadian C-spine rule</b>	Papic, 2023	Level 1 <sup>1</sup>	Sensitivity: range 90 to 100%	Not reported
	Blanpied, 2017	Level 2 <sup>2 3 4</sup>	Sensitivity: 99.4% (95% CI: 96 – 100) Specificity: 45.1% (95% CI: 44 – 46) NPV: 100%	Not reported
	Coté, 2016	Level 1 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
	Sterling, 2008	Level 2 <sup>4,8</sup>	Sensitivity: 100% Specificity: 42.5%	<i>“One or two primary studies with low risk of bias”</i>
<b>Positive Canadian C-spine rule in patients aged 65 or less</b>	Lemeunier, 2017	Not reported	Not reported	<i>“Based on scientific presumption provided by studies with an intermediate level of evidence, such as low-powered randomized controlled trials, well-conducted nonrandomized comparative studies, cohort studies”</i>
<b>Positive NEXUS criteria</b>	Blanpied, 2017	Level 2 <sup>9</sup>	Sensitivity 90.7% (CI 95%: 85 - 94) Specificity: 36.8% (CI 95%: 36 - 88) NPV: 99.4%	Not reported
<b>Positive NEXUS criteria in patients aged more than 65</b>	Lemeunier, 2017	Not reported	Not reported	<i>“Based on scientific presumption provided by studies with an intermediate level of evidence, such as low-powered randomized controlled trials, well-conducted nonrandomized comparative studies, cohort studies”</i>
<b>Traumatic event</b>	Bier, 2018	Level 5 <sup>7 10</sup>	Not reported	Not reported
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Prolonged steroid treatment</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>History of osteoporosis</b>	Bier, 2018	Level 5 <sup>7</sup>	Not reported	Not reported
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the</i>

				<i>opinions of the members of the working group responsible for these recommendations.”</i>
<b>Age &lt; 20</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Age &gt; 60</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Older age</b>	Bier, 2018	Level 5 <sup>10</sup>	Not reported	Not reported
<b>Intractable pain continuing one month after treatment</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Nocturnal pain</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Pain related to movement and posture</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Pain of the spinous processes</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>OSTEOPOROTIC FRACTURES (Number of guidelines = 2, Red flags = 3)</b>				
<b>History of osteoporosis</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Use of corticosteroids</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Older age</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>



<b>CANCER (Number of guidelines = 5, Red flags = 21)</b>				
<b>History of cancer</b>	Bier, 2018	Level 5 <sup>12 7</sup>	Not reported	Not reported
	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Unexplained weight loss</b>	Bier, 2018	Level 5 <sup>12 7</sup>	Not reported	Not reported
	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Poor general health</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>Nocturnal pain</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Pain that wakes you up in the morning</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>Intractable pain continuing one month after treatment</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the</i>

				<i>opinions of the members of the working group responsible for these recommendations.”</i>
<b>Pain related to movement and posture</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Intolerable pain that cannot be relieved at rest</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>Pain that worsens excessively within a short period of time</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>Pain of the spinous processes</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Age &gt; 50</b>	Bier, 2018	Level 5 <sup>12</sup>	Not reported	Not reported
	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Age &lt; 20</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Age &gt; 60</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Lack of improvement after first month of treatment</b>	Bier, 2018	Level 5 <sup>12 7</sup>	Not reported	Not reported
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Marked deviation from the norm in intensity, location, duration or response to treatment</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>Palpable cervical or paracervical masses</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>

<b>Fever</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>Abnormal fatigue</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>Headache</b>	Bier, 2018	Level 5 <sup>7</sup>	Not reported	Not reported
<b>Vomiting</b>	Bier, 2018	Level 5 <sup>7</sup>	Not reported	Not reported
<b>Dysphagia</b>	Bier, 2018	Level 5 <sup>7</sup>	Not reported	Not reported
<b>SPINAL INFECTION (Number of guidelines = 4, Red flags = 14)</b>				
<b>Symptoms and signs of infection (e.g., fever, night sweats)</b>	Bier, 2018	Level 5 <sup>7</sup>	Not reported	Not reported
<b>Risk factors for infection (e.g., immunosuppression, penetrating wound, intravenous drug abuse)</b>	Bier, 2018	Level 5 <sup>7</sup>	Not reported	Not reported
<b>Fever</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Intravenous drug use</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 field <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Drug addiction</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Recent infection</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group</i>

				<i>responsible for these recommendations.</i> "
<b>HIV positivity</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>"Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations."</i>
<b>Immunosuppression</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>"Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations."</i>
<b>Age &lt; 20</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>"Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations."</i>
<b>Age &gt; 60</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>"Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations."</i>
<b>Intractable pain continuing one month after treatment</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>"Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations."</i>
<b>Nocturnal pain</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>"Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations."</i>
<b>Pain related to movement and posture</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>"Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations."</i>
<b>Pain of the spinous processes</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>"Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations."</i>
<b>MYELOPATHY (Number of guidelines = 5, Red flags = 15)</b>				
<b>Painful stiff neck</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>"As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature"</i>

<b>Neurological symptoms (e.g., sensory deficits, motor weakness, bowel or bladder dysfunction)</b>	Bier, 2018	Level 5 <sup>7</sup>	Not reported	Not reported
<b>Arm pain</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Pain radiating to upper and lower limbs</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Sensory deficit</b>	Karppinen, 2017	Not reported	Not reported	Not reported
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Sensory changes in the lower extremities</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Impaired motor skills</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
<b>Motor weakness</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Muscular atrophy</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Spasticity</b>	Karppinen, 2017	Not reported	Not reported	Not reported
<b>Hyperreflexia</b>	Lemeunier, 2017	Not reported	Not reported	Not reported

	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Changes in bladder or bowel retention</b>	Karppinen, 2017	Not reported	Not reported	Not reported
<b>Sphincter incontinence</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Spastic gait</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Difficulty in walking</b>	Karppinen, 2017	Not reported	Not reported	Not reported
	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>INJURY TO THE SPINAL CORD (Number of guidelines = 1, Red flags = 1)</b>				
<b>Neurological symptoms (e.g., sensory deficits, motor weakness, bowel or bladder dysfunction)</b>	Bier, 2018	Level 5 <sup>7</sup>	Not reported	Not reported
<b>CAROTID/VERTEBRAL ARTERY DISSECTION (Number of guidelines = 4, Red flags = 7)</b>				
<b>Sudden onset of headache or neck pain</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Cerebrovascular symptoms or signs</b>	Bier, 2018	Level 5 <sup>14</sup>	Not reported	Not reported
<b>Visual disturbances</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>Half - symptoms</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>Higher brain function disorders</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>Horner’s syndrome</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported

<b>Cranial nerve dysfunctions, especially in the lower cranial nerves</b>	Karppinen, 2017	Level 5 <sup>13</sup>	Not reported	Not reported
<b>INTRACRNIAL PATHOLOGY (Number of guidelines = 3, Red flags = 3)</b>				
<b>Positive Valsalva maneuver in patients with headache that worsens with exertion</b>	Blanpied, 2017	Level 5 <sup>13</sup>	LR+: 2.3 (95% CI: 1.4 – 3.8)	Not reported
<b>Sudden onset of headache</b>	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Reported “worst headache ever”</b>	Whalen, 2019	Level 5 <sup>15,16</sup>	Not reported	Not reported
<b>INFLAMMATORY ARTHRITIS (Number of guidelines = 2, Red flags = 2)</b>				
<b>Morning stiffness</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
	Coté, 2016	Level 5 <sup>5 6 7</sup>	Not reported	<i>“As there is a paucity of literature on red flags for neck pain, the list of red flags was informed by the low back pain literature”</i>
<b>Swelling in multiple joints</b>	Lemeunier, 2017	Not reported	Not reported	Not reported
<b>SYSTEMIC DISEASE (Number of guidelines = 2, Red flags = 6)</b>				
<b>Presence of a rheumatological disease</b>	Monticone, 2013	Level 5 <sup>7,11</sup>	Not reported	<i>“Evidence based on the opinions of experts in guidelines or during consensus conferences, or the opinions of the members of the working group responsible for these recommendations.”</i>
<b>Headache</b>	Bier, 2018	Level 5 <sup>17</sup>	Not reported	Not reported
<b>Fever</b>	Bier, 2018	Level 5 <sup>17</sup>	Not reported	Not reported
<b>Unilateral skin rash</b>	Bier, 2018	Level 5 <sup>17</sup>	Not reported	Not reported
<b>Burning pain</b>	Bier, 2018	Level 5 <sup>17</sup>	Not reported	Not reported
<b>Itching</b>	Bier, 2018	Level 5 <sup>17</sup>	Not reported	Not reported
<b>GENERAL PATHOLOGIES (Number of guidelines = 2, Red flags = 19)</b>				
<b>History of known connective tissue disease</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported

<b>History of Osteopenia</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
<b>History of significant trauma</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
<b>History of infection</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
<b>Unexplained/novel neck pain especially ages &lt; 20 or &gt; 55</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
<b>History of cancer</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
<b>Unexplained weight loss</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
	Scherer, 2016	Not reported.		
<b>Severe nocturnal pain</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
<b>Confusion/altered consciousness</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
	Scherer, 2016	Not reported	Not reported	Not reported
<b>Visual or speech disturbances</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
<b>Weakness</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
<b>Loss of sensation</b>	Whalen, 2019	Level 5 <sup>7 15 18</sup>	Not reported	Not reported
<b>Abnormal upper extremity sensory, motor or deep tendon reflexes</b>	Whalen, 2019	Level 5 <sup>7 15 18 19</sup>	Not reported	Not reported
<b>Fever</b>	Whalen, 2019	Level 5 <sup>7 15 18 19</sup>	Not reported	Not reported
	Scherer, 2016	Not reported	Not reported	Not reported
<b>Nuchal rigidity</b>	Whalen, 2019	Level 5 <sup>7 15 18 19</sup>	Not reported	Not reported
<b>Positive Rust, Lhermette, Hoffman or Babinski sign</b>	Whalen, 2019	Level 5 <sup>7 15 18 19</sup>	Not reported	Not reported
<b>Pain pattern unrelated to movements or activities</b>	Whalen, 2019	Level 5 <sup>7 15 18 19</sup>	Not reported	Not reported



Headache with nausea, vomiting or dizziness	Scherer, 2016	Not reported	Not reported	Not reported
Reduced general condition	Scherer, 2016	Not reported	Not reported	Not reported
<b>GENERAL PATHOLOGIES IN WAD (Number of guidelines = 1, Red flags = 9)</b>				
Bilateral paresthesia in upper/lower limbs	Moore, 2005	Not reported	Not reported	Not reported
Gait disturbances (e.g., tripping and coordination difficulties)	Moore, 2005	Level 5 <sup>20,21</sup>	Not reported	Not reported
Spastic paresis	Moore, 2005	Level 5 <sup>21</sup>	Not reported	Not reported
Positive Lhermitte's sign	Moore, 2005	Not reported	Not reported	Not reported
Hyperreflexia	Moore, 2005	Level 5 <sup>21</sup>	Not reported	Not reported
Nerve root signs at more than two adjacent levels	Moore, 2005	Level 5 <sup>22 23</sup>	Not reported	Not reported
Progressively worsening neurological signs	Moore, 2005	Level 5 <sup>22 23</sup>	Not reported	Not reported
Symptoms of upper cervical instability	Moore, 2005	Level 5 <sup>24</sup>	Not reported	Not reported
Non-mechanical pain which is unremitting and severe	Moore, 2005	Level 5 <sup>22 23</sup>	Not reported	Not reported

WAD: whiplash and associated disorders

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**SUPPLEMENTARY MATERIAL 4 - ADDITIONAL REFERENCES PROVIDED BY  
BLANPIED ET AL. (2017)**

“Clinical tests used in the diagnostic process for cervical myelopathy generally have low sensitivity; therefore, they should not be used when screening for and diagnosing this condition.”<sup>1</sup>

“The 2012 IFOMPT “International Framework for Examination of the Cervical Region for potential of Cervical Arterial Dysfunction prior to Orthopaedic Manual Therapy Intervention” provides a decision-making pathway for assessment of suspected arterial insufficiency and upper cervical ligamentous integrity.<sup>177</sup> Because clinicians cannot rely on the results of any single test, including imaging,<sup>146</sup> the framework provides a tool to guide assessment of both risk factors and clinical presentation, and to make patient-centered, evidence-driven decisions on management”

“One high-quality systematic review by Hutting et al<sup>95</sup> revealed poor diagnostic accuracy for all upper cervical ligament integrity tests evaluated. Generally, these tests have sufficient specificity and can rule in upper cervical ligamentous insufficiency, but extent of sensitivity varied.”<sup>2</sup>

“The National Institute for Health and Care Excellence produced a guideline that lists signs, symptoms, and conditions that should be considered when deciding the need for additional screening in patients who present with a headache in addition to neck pain.”<sup>3</sup>

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