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Jim Parker
British Columbia Nurses' Union
4060 Regent Street
Burnaby, BC V5C 6P5

Re: Pre-consultation on new ASTD Policy – Ergonomist perspective.

This document provides preliminary discussion and opinion regarding pending development of new policy for ASTD claims at WorkSafeBC, with the intent of providing constructive feedback that may assist BCNU and/or WorkSafeBC in efforts to improve ASTD policy and claims adjudication, and to address related recommendations contained within the Petrie Report and the Patterson Report.

Qualifications and Experience

Dan Robinson is a Canadian Certified Professional Ergonomist (CCPE), Fellow of the Association of Canadian Ergonomists and has been consulting in Ergonomics for more than 30 years. His education includes both M.Sc. and Ph.D. in Kinesiology from Simon Fraser University. Dan's Doctoral research focused on biomechanics and the estimation of internal tissue forces towards estimation of injury risk to spinal tissue from cumulative tissue strain. Dan is a past Chair and current Member of several Canadian Mirror Committees (CMC) to the International Organization for Standardization (ISO), including: Ergonomics (TC159), Ergonomics: Anthropometry and Biomechanics (TC159/SC3) and Ergonomics of the Physical Environment (TC159/SC5). He has guided and contributed to the development, review and revision of international Standards related to ergonomics and the assessment of occupational risk factors.

Dan's experience with WorkSafeBC includes support and feedback to WorkSafeBC Ergonomists/Human Factors Specialists regarding MSI prevention, several research projects aimed at prevention of MSI and funded by the WorkSafeBC Research Division, and the provision of independent ergonomics assessment and expert opinion to inform claims appeals at Review Division and at WCAT. Experience providing ergonomics services to industry includes assistance to comply with BC OHS Regulations (MSI Requirements), prevention of MSI, accommodations for injured workers, and independent ergonomics assessment and opinion related to WorkSafeBC claims.

Background

The opinion and recommendations contained within this letter were informed by review of relevant portions of the following documents:

- Memorandum – ASTDs of the Limbs – CPR Recommendations #36 and #37. July 13, 2023. From WorkSafeBC PRRD to BCNU. (Memo to BCNU)
- Research Snapshot. Risk factors for activity-related soft tissue disorders. Systematic Review Grant Project RS2019-SP03. WorkSafeBC.
- Koes, Bart, et al.. What are the physical and psychosocial risk factors associated with the development of activity-related soft tissue disorders of the limbs? Final Report. WorkSafeBC Project RS2019-SP03. (Systematic Review)
- Petrie, Paul, March 31, 2018. Restoring the balance. A worker-centred approach to Workers' Compensation Policy. A report to the Board of Directors, Workers' Compensation Board of BC. (Petrie Report).

- Patterson, Janet, October 30, 2019. New Directions: Report of the WCB Review 2019. Report to the British Columbia Minister of Labour, Honourable Harry Bains. (Patterson Report).
- Current WorkSafeBC Policy and Practice Directives:
  - Rehabilitation Services & Claims Manual, Volume II, Sections C4-27.10 and C4-27.20, amended to December 1, 2022.
  - Practice Directive #C4-2, August 9, 2005, amended to December 30, 2021.
- Current BC OHS Regulations on "Ergonomics (MSI) Requirements" and supporting documents:
  - BC OHS Regulation, Sections 4.46-4.53.
  - WorkSafeBC (2022) MSI Risk Assessment Worksheet, July 2022.

The Memo to BCNU provides an overview of proposed amendments to C4-27.10 and C4-27.20, which are indicated in the Memo as having an intent to address Petrie Report recommendations #36 and #37, as well as Patterson Report recommendations related to gender gaps in claims acceptance, treating ASTDs as personal injuries, and the integration of MSI prevention guidelines into compensation policy and practice. The Memo indicates that proposed amendments were informed by the Systematic Review, noting that "no strong conclusions could be made regarding possible causal relationships." Brief discussion and my opinion on statements within the Memo and on the proposed amendments to Policy are provided below.

1. Terminology. Use of MSI and ASTD is inconsistent across regulation, prevention, policy and practice. Regulation and prevention use "musculoskeletal injury" (MSI). Policy and practice use "activity-related soft tissue disorder" (ASTD). This needs to be harmonized for clarity and to address recommendations in both Petrie and Patterson Reports to harmonize prevention and regulation with policy and practice. In my experience, many employers are not clear that MSI and ASTD refer to the same soft tissue disorders. If there is intent to harmonize policy, practice, prevention and regulation, this needs to be addressed.

2. Conclusions of the Systematic Review. The Systematic Review contains a thorough, well considered analysis; however, in my opinion, there is potential to misinterpret the conclusions when applying to policy, practice and adjudication of claims.

   The Systematic Review states a conclusion on page 7: "… for all investigated combinations of exposures and outcomes, some studies showed significant associations between physical and psychosocial exposures and the occurrence of ASTDs… our findings do not allow the conclusion that physical or psychosocial exposures do not play a casual role in the development of the assessed ASTDs." A second statement on page 8 indicates "…evidence does not allow for strong conclusions regarding a possibly causal relationship between work-related physical and psychosocial exposures and a number of ASTDs." The Systematic Review discussed the difference between cross-sectional data analysis, which can inform regarding associations between risk factors and ASTDs at a specific point in time (ASTD prevalence and correlation with risk factors), versus longitudinal research which can inform regarding the development of an ASTD across a period of exposure to risk factors (ASTD incidence and causation or dose-response relationships). They note the lack of quality longitudinal research and several other issues in reviewed research, such as lack of consistent ASTD diagnoses, quantification of occupational risk factors, and risk of bias. These factors hinder the ability to define causal relationships and contribute to mixed or inconclusive findings across studies. This lack of quality

epidemiological studies lead to another recommendation within the Systematic Review (page 8): "Accordingly, in policy making cut-off values of exposure should be applied with great caution."

Conclusions of the Systematic Review may be misinterpreted as indicating a lack of association between occupational risk factors and ASTDs because of the statement that causal relations cannot be strongly concluded. This is not what the Systematic Review found. In my experience, lack of strong causal evidence in the scientific literature has been used to diminish the significance of occupational risk factors during the adjudication of claims and in clinical opinions regarding the likelihood of work-relatedness when relevant occupational risk factors exist. As an example of how language may lead to differing interpretations, there is a difference between The Memo to BCNU and the Research Snapshot in how the conclusions of the Systematic Review are stated. The Memo states in text and in footnote 3 that no strong conclusions could be made regarding possible causal relationships. This simplification of the Systematic Review conclusions focuses on what was not found, but does not reflect the complexity or the tone within the Systematic Review and drops the qualifier at the end of this statement in the Systematic Review (page 8): "… of a number of ASTDs" (not all ASTDs). In my opinion, simplification of the conclusions is likely to lead to misinterpretation that the Systematic Review indicates a lack of association between occupational risk factors and ASTDs. This was not the conclusion of the Systematic Review. The Research Snapshot more accurately represents the key findings of the Systematic Review and the primary conclusion that "WorkSafeBC cannot conclude that exposures *do not* play a causal role in the development of the assessed ASTDs". The latter statement promotes consideration of occupational risk factors within the context of biological plausibility that exposure could lead to an ASTD. Any reference to the Systematic Review within development of policy, practice, or within adjudication of claims should provide greater context to reflect the complexity of the findings, and should rely on an assessment of occupational risk factors with an assumption that those risk factors have the potential to contribute to causation of an ASTD. The evidence does not support a conclusion that occupational risk factors are trivial.

3. Interpretation of systematic reviews and epidemiological evidence. Amendment to 27.10 includes: "…risk factors set out in policy, and the current medical/scientific evidence". Systematic reviews of epidemiological research are frequently cited and used in expert or clinical opinions as indicating the lack of strong evidence for an association between risk factors and specific ASTDs, and presented to support a lack of work-relatedness when occupational risk factors that meet policy or practice thresholds are otherwise noted as present. The discussion within the Koes et al. Systematic Review regarding weaknesses in the body of existing research on ASTD causation and their conclusion that occupational risk factors cannot be excluded as relevant to ASTDs based on that body of research is important in the interpretation of findings within that and other systematic reviews. Weakness of association and lack of evidence for causation within epidemiological research should not, in my opinion, supersede biological plausibility based on biomechanics and functional anatomy within a single claim. Biological plausibility is based on identifying occupational risk factors that involve and have the potential to strain the injured tissues through forceful exertion, awkward postures, repetitive movement, sustained effort (posture or force), or vibration. The existence of biologically relevant risk factors should be accepted as evidence of sufficient risk of work-relatedness in an individual case, regardless of any epidemiological evidence to the contrary. Epidemiological evidence is

based on population response rather than individual response. ASTDs that are work-related may occur in an individual when the majority of the working population would not experience the same injury. In my opinion, reliance on epidemiological data to determine the likelihood of work-relatedness is flawed when adjudicating the work-relatedness of an individual's claim. A strong epidemiological association between risk factors and an ASTD, or between occupation and an ASTD, is indicative that occupational risk factors are likely to be relevant for an individual claim but still requires assessment of those risk factors for the individual work scenario. A weak epidemiological association between risk factors and an ASTD, or lack of evidence of an association within epidemiological research, does not indicate that risk factors are likely to be irrelevant. The same assessment of risk factors in the workplace is warranted. Proposed changes to consider individual characteristics when determining work-relatedness might be interpreted as supporting the assertion that an individual may experience work-related injury when it is rare in a working population; however, there is no indication in policy or practice that lack of epidemiological evidence does not diminish the relevance of work-related risk factors in the determination of biological plausibility for individual injury causation.

There is a proposed amendment to ensure that work causation is determined on a case-by-case basis if Schedule 1 requirements for the ASTD are not met. This partially addresses the issue of ensuring that individual cases are evaluated; however, it does not address the incorrect application of epidemiological research when performing that assessment.

4. Petrie Report recommendation #36 – amend policy to ensure the use of relevant risk analysis data from the workplace be considered in adjudication of claims. Discussion in the Petrie Report references BC OHS Regulation (Ergonomics MSI Requirements) and guidance within prevention worksheets used by employers to assess risk in the workplace. In my opinion, there are problems with risk factor thresholds that are currently contained within each of policy, C4-2, regulation, and MSI prevention tools intended for the workplace, such as the MSI Risk Factor Assessment Worksheet and the prior MSI Risk Identification Checklists A and B. Guidance thresholds in these documents need to be reviewed, updated, harmonized and referenced to the source research. This does not appear to have been addressed in the proposed policy amendments, beyond the addition of the word "generally" to the postural thresholds that already exist.

5. Petrie Report recommendation #37 - develop ASTD policy on risk factors consistent with regulation and guidance. This recommendation is also reflected in the Patterson Report regarding the integration of MSI prevention guidelines into compensation policy and practice. The related example in the Petrie Report outlines computer MSI claims that are denied based on the presence of only repetition and indicates the need to revise risk factors appropriately to recognize that single risk factors may provide sufficient risk to support work causation if the intensity or duration are high, as reflected in prevention guidance. In my opinion, recognition of single risk factors is an appropriate step, is somewhat addressed in proposed policy changes, and may assist with the scenario of computer MSI; however, there remain significant issues with how risk factors are assessed during risk factor evaluations of computer work. These include incorrect repetition thresholds in C4-2, and inaccurate risk factor evaluation from job site visits.

   C4-2 indicates a repetition threshold of 200 movements/finger (100 keystrokes/finger) for greater than 4 hours, which is equivalent to typing at 160 wpm. This would be a very rare occurrence in

computer work, and is an incorrect interpretation of the research upon which this rate is based. The rate of repetition should refer to a total of 200/min across all 8 fingers, or 25/min per finger. It does not apply to the thumb. This threshold needs revising or clarification in policy or practice directive to indicate repetition thresholds for finger movement of 200 movements/8 fingers or 25 movements/min/finger. In my opinion, this change would assist with recognition of repetitive finger movement as a single risk factor.

Inaccurate or inadequate evaluation of risk factors for computer work is a second issue that was not identified specifically but is relevant to recommendation #38 in the Petrie Report and recommendation #85 (page 204) in the Patterson report: "that the Board ensure that ergonomic assessments are conducted by qualified professionals". Awkward postures of the wrist and repetitive wrist movements are frequently not recognized or accurately quantified during assessment of keyboard or mouse use, and during other work. There is a consistent failure to identify observable ulnar deviation greater than 10 degrees associated with hand position on a keyboard or mouse. In my experience, similar inaccuracies in the evaluation of risk factors are common within ASTD Risk Evaluation Reports that are used to assess work-relatedness for ASTDs in computer work as well as other types of work. Assessment skills for posture by WorkSafeBC employees do not appear to be adequate to reliably identify lateral wrist deviation during keyboard and mouse use, leading to failure to identify awkward wrist posture as a risk factor in computer MSI. Failure to identify awkward wrist postures and wrist movements while sustaining or moving through those postures leads to underestimation of the significance of wrist repetition rates and failure to identify the second risk factor of awkward posture. This leads to the scenario described in the Petrie Report of identifying only a single risk factor when there are two or more risk factors present. There are currently two professional certifications for professional ergonomists in North America, CCPE in Canada and CPE in USA. Occupational Therapists, Physiotherapists or Kinesiologists are often also considered to have professional competence in ergonomic assessment; however, specific training in ergonomics varies and may or may not be present for individual practitioners in these professions. WorkSafeBC Case Managers who perform risk evaluations are not professionally certified in ergonomics and are not required to have a related undergraduate or graduate degree. In my opinion, this contributes to the inaccuracies in technical assessment of risk factors associated with claims.

Accurate quantification of rates of wrist and finger movement, appropriate thresholds for finger movement, and recognition of awkward lateral wrist postures are required to address the intended outcome of accepting MSI that are legitimately associated with computer work. This is also relevant to the Patterson Report recommendations regarding gender differences in rates of claims acceptance, which was indicated as possibly related to a larger population of women than men performing computer-based work.

The issue of denying computer work claims based on identification of only a single risk factor is addressed in proposed policy amendments by indicating that single risk factors may be sufficient for causation; however, the issues of accurate and skilled assessment of posture and rates of repetition, and misinterpretation of guidance thresholds for repetition are not addressed.

6. Precision and language within 27.10 and 27.20. There are terms used that may increase uncertainty or variability in interpretation and application of policy. These include:

a. 27.10 amendment to reinforce work causation test uses the terms "more than a trivial or insignificant aspect". There is no definition for what trivial or insignificant mean in the determination of risk factor exposure. If this specifically refers to exposure durations within practice directives or policy or prevention documents, there should be reference to these documents to provide clarity of interpretation.

b. The Patterson Report noted a gender inequity in acceptance of claims. The denial of most claims related to computer work was indicated as a possible contributor. In my experience, there has also been denial of claims based on an assumption that being female and over 40 years of age presents a greater level of risk for certain ASTDs than the identifiable risk factors in the workplace. As such, the claim is denied. The proposed policy change in C27.10 that "all relevant individual characteristics must be considered" has the potential to work counter to the intent of gender equity in adjudication of claims if being female and over 40 is interpreted as more significant than repetitive or forceful awkward shoulder postures for shoulder tendinopathies, for example. While individual characteristics and circumstances should be considered, there is no guidance regarding the relative weight assigned to those characteristics versus the occupational risk factors that may exist.

c. 27.10 proposed amendment to indicate that a single risk factor may be sufficient to cause an ASTD under certain conditions. It is not clear what "certain conditions" means. Recommend indicating that single risk factors that exceed thresholds in policy or practice are sufficient. Where two or more risk factors exist, those thresholds may be lower. Guidance on the assessment of single risk factors is required to put this policy into practice.

d. The proposed amendment to add the word "generally" into C27.20 related to hand-wrist and shoulder posture thresholds may increase variability and uncertainty in how specific cases are adjudicated. It is not clear how "generally" is to be interpreted, leaving it entirely to the adjudicator to decide whether a threshold should be more or less for a specific claim. Although the Systematic Review indicated that thresholds need to be cautiously determined, in my opinion, there needs to be a guidance threshold around which risk may be assessed to provide clarity and consistency in the interpretation of policy. The current language in C4-2 indicates that thresholds within that practice directive are not intended to be absolutes but are to be used as guidelines only. In practice, the policy and C4-2 guidelines tend to be interpreted as absolutes, despite the wording. Perhaps a better approach would be to use language within policy that is similar to the first paragraph of C4-2 Appendix, indicating that single risk factors exceeding these thresholds present sufficient risk of injury, and those thresholds may be lower when two or more risk factors exist simultaneously. This would support the intent of proposed amendments to consider singular risk factors, recognize that combined exposures are more severe, and provide thresholds above which risk is clearly considered significant. The current use of "generally" leaves uncertainty in how thresholds are to be applied in the assessment of work.

e. Proposed amendment to 27.20 indicates the definition of frequently repeated as "at least once every 30 seconds". This is inconsistent with guidance for wrist repetition in C4-2,

which indicates 2/minute through full range of movement or 10/min through less than full range. Policy and practice should be consistent.

f. 27.20 definition of frequently repeated uses "…time for the affected muscle/tendon groups to return to a relaxed or resting state". In my experience, the definition of a relaxed or resting state is often misinterpreted as meaning postures less than the awkward posture threshold rather than fully neutral (typically 0 degrees). Resting states are either fully supported or fully neutral with no muscle/tendon activity. This could be better defined.

7. The proposed amendments address ASTDs of the limbs. MSI in regulation and prevention include soft tissue injuries of the neck and back. There is no parallel policy to support adjudication of these injuries. While beyond scope of the proposed amendments related to ASTDs of the limbs, this is an issue that persists.

I remain available for further assistance or to provide clarification.

Sincerely,

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Robinson Ergonomics Inc.