Impact of pre-existing chronic conditions on age differences in sickness absence after a musculoskeletal work injury: A path analysis approach
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Appendices A and B

Appendix A

Method used to identify musculoskeletal injury claims

Musculoskeletal disorder (MSD) injuries were defined using nature of injury and event leading to injury codes from the Canadian Standards Association Z-795 injury classification system. This method of identifying musculoskeletal injuries was developed by Jonathan Tyson of the Ontario Pulp and Paper Health & Safety Association, and is based on the Z795 Injury Codes (“MSD case definition,” 2012).

Nature of Injury Codes

- 021XX = Sprains, strains, tears
- 029XX = Other injuries to muscles, tendons, ligaments, joints, etc. not classified elsewhere
- 082XX = Sprains and bruises
- 09720 = Nonspecific injuries and disorders – back pain, hurt back
- 09730 = Soreness, pain, hurt, except the back
- 12410 = Disorders of the peripheral nervous system – carpal tunnel syndrome
- 13710 = Raynaud’s Syndrome or Phenomenon, Vibration Induced White Finger
- 153XX = Hernia
- 170XX = Musculoskeletal system and connective tissue diseases and disorders
- 172XX = Dorsopathies
- 173XX = Inflammation and irritation of joints, tendons, muscles and connective tissues
- 174XX = Osteopathies, chondropathies, acquired deformities
- 179XX = Other musculoskeletal system and connective tissue diseases and disorders
- 41200 = Symptoms involving nervous and musculoskeletal systems – symptoms involving nervous and musculoskeletal systems, unspecified.
- 41280 = Symptoms involving nervous and musculoskeletal systems – multiple symptoms involving nervous and musculoskeletal systems
- 41290 = Symptoms involving nervous and musculoskeletal systems – multiple symptoms involving nervous and musculoskeletal systems, n.e.c.
- 41480 = Symptoms involving head and neck – multiple symptoms involving head and neck
- 41490 = Symptoms involving head and neck – multiple symptoms involving head and neck, nec

**Injury Event Codes**
- 20XXX = Bodily reaction and exertion, unspecified
- 21XXX = Bodily reaction
- 22XXX = Overexertion
- 23XXX = Repetitive motion
- 25XXX = Static posture without application of force to an object
- 26XXX = Static posture with application of force to an object
27XXX = Other bodily conditions  
29XXX = Other bodily reaction and exertion

**Appendix 2: Table A2: ICD Codes Used to Define Chronic Conditions**

| Disorder                  | ICD9                          | ICD10                       | Reference                  |
|---------------------------|-------------------------------|-----------------------------|----------------------------|
| 1. Diabetes               | -250: Diabetes Mellitus       | -E10 – E14: Diabetes Mellitus | Lix et al (2008) (1)       |
|                           |                               |                             | Hux et al (2002) (2)       |
| 2. Rheumatoid Arthritis   | -714: Rheumatoid arthritis    | -M05-M06: Rheumatoid arthritis | Lix et al (2008) (1)       |
| 3. Osteoarthritis         | -715: Osteoarthritis          | -M15-M19: Osteoarthritis    | Lix et al (2008) (1)       |
| 4. Hypertension           | -401: Essential hypertension | -I10: Essential (primary) hypertension | Tu et al (2007) (3)       |
|                           | -402: Hypertensive heart disease | -I11: Hypertensive heart disease |                             |
|                           | -403: Hypertensive chronic kidney disease | -I12: Hypertensive renal disease |                             |
|                           | -404: Hypertensive heart and chronic kidney disease | -I13: Hypertensive heart and renal disease |                             |
|                           | -405: Secondary hypertension | -I15: Secondary hypertension |                             |
| 5. Coronary Heart Disease (CHD) | -410-414: Ischemic heart disease | -I20-I25: Ischemic heart disease | Lix et al (2008) (1)       |
| 6. Thyroid conditions     | -240: Simple and unspecified goiter | -E00: Congenital iodine-deficiency syndrome | Investigator Team |
|                           | -241: Nontoxic nodular goiter  | -E01: Iodine-deficiency-related thyroid disorders and allied conditions |                             |
|                           | -242: Thyrotoxicosis with or without goiter | -E02: Subclinical iodine-deficiency hypothyroidism |                             |
|                           | -243: Congenital hypothyroidism | -E03: Other hypothyroidism |                             |
|                           | -244: Acquired hypothyroidism  | -E04: Other nontoxic goitre |                             |
|                           | -245: Thyroiditis              | -E05: Thyrotoxicosis [hyperthyroidism] |                             |
|                           | -246: Other disorders of thyroid | -E06: Thyroiditis |                             |
|                           |                               | -E07: Other disorders of thyroid |                             |
| 7. Hearing                | -389: Hearing loss         | -H90: Conductive and sensorineural hearing loss | Investigator Team |
|                           | -V72.12: Encounter for hearing conservation and treatment | -H91: Other hearing loss |                             |
|                           | -V72.19: Other examination of ears and hearing | -Z01.1: Examination of ears and hearing |                             |

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1 The MSP records used for this analysis were coded according to ICD9 only. The DAD records were coded according to ICD9 until the end of fiscal year 2000-01, and then to ICD10-CA for the remaining years. From fiscal year 2001-02 to fiscal year 2006-07 (inclusive), these DAD records also contain ICD9 codes because CIHI translated the original ICD10-CA codes to ICD9 codes in these years.

2 To avoid counting gestational diabetes as chronic diabetes, we did not classify a respondent as “diabetic” if the medical or hospital records indicating this disorder were preceded, within 150 days, of a physician or hospital record for an obstetric event (defined as ICD9=630 to 679 or ICD10-CA=O00 to O99).

3 To avoid counting gestational hypertension as chronic hypertension, we did not classify a respondent as “hypertensive” if the medical or hospital records indicating this disorder were preceded, within 120 days, or followed, within 90 days, by a hospital record for an obstetrical event (defined as ICD9=630 to 679 or ICD10-CA=O00 to O99).
| 8. Depression | - 311: Depression, NOS | - F32: Depressive episode | CIHI (2008) (4) |
|---------------|------------------------|------------------------|----------------|
| - 300.4: Dysthymic disorder | - F33: Recurrent depressive disorder | Townsend (2010, 2012) (5, 6) |
| - 296.2: Major depressive disorder, single episode | - F34.1: Dysthymia | |
| - 296.3: Major depressive disorder, recurrent | - F38.1: Other recurrent mood [affective] disorders | |

References

1. Lix L, Yogendran M, Mann J. Defining and Validating Chronic Diseases: An Administrative Data Approach. Winnipeg (MB): Manitoba Centre for Health Policy, University of Manitoba; 2008, November.
2. Hux JE, Ivis F, Flintoft V, Bica A. Diabetes in Ontario: Determination of prevalence and incidence using a validated administrative data algorithm. Diabetes Care. 2002;25(3):512-6.
3. Tu K, Campbell NRC, Chen ZL, Cauch-Dudek J, McAlister FA. Accuracy of administrative databases in identifying patients with hypertension. Open Med. 2007;1(1):E18-E26.
4. Canadian Institute for Health Information. Hospital Mental Health Services in Canada, 2005–2006. Ottawa (ON): Canadian Institute for Health Information; 2008.
5. Townsend L, Walkup JT, Crystal S, Olfson M. Mini-sentinel systematic evaluation of health outcome of interest definitions for studies using administrative data: Depression report. Silver Spring (MD): U.S. Food and Drug Administration (FDA), 2010, December. Contract number HHSF223200910006I.
6. Townsend L, Walkup JT, Crystal S, Olfson M. A systematic review of validated methods for identifying depression using administrative data. Pharmacoepidemiology and Drug Safety. 2012;21(S1):163 -- 73.