

Overview of Chronic Pain Research Drawing on Administrative Data

Appendix

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Overview of Chronic Pain Research Drawing on Administrative Data

This appendix accompanies the RAND report *Chronic Pain Among Service Members: Using Administrative Data to Strengthen Research and Quality Improvement*, available at www.rand.org/t/RRA1160-1. That report examines the prevalence of chronic pain among U.S. service members, the implications for military readiness, initiatives across the Military Health Service (MHS) to align chronic pain treatment with clinical practice guidelines, and how MHS administrative data could inform treatment decisions and quality improvement efforts. The report also outlines several investment priorities for the MHS and U.S. Department of Defense to improve the identification of service members with chronic pain and approaches to monitoring the quality of the care they receive.

The following research literature, referenced in the report, used administrative data to examine chronic pain prevalence and treatment for both military and civilian populations. This appendix briefly describes the criteria that each study used to identify individuals with chronic pain and lists the related International Classification of Diseases, ninth or tenth revision (ICD-9 or ICD-10), diagnosis codes, where available. Studies are listed in alphabetical order by the first author's last name.

Amanda J. Abraham, Traci Rieckmann, Yifan Gu, and Bonnie K. Lind, "Inappropriate Opioid Prescribing in Oregon's Coordinated Care Organizations," *Journal of Addiction Medicine*, Vol. 14, No. 4, July–August 2020, pp. 293–299.

Study Objective

Describe the characteristics of patients with a pain diagnosis who fill potentially inappropriate opioid prescriptions through Oregon Medicaid.

Population

Civilian

Chronic Pain Definition

- Individuals were considered to have chronic pain if they had at least one qualifying acute or chronic pain ICD-9 diagnosis in a calendar year (see Table A.1).
- Individuals with cancer diagnoses were excluded, as well as those who were eligible for both Medicare and Medicaid.

Table A.1
ICD-9 Diagnosis Codes for Chronic Pain Clusters in Abraham et al., 2020

Diagnostic Clusters	ICD-9 Diagnosis Codes
Chronic pain	338.21, 338.22, 338.28, 338.29, 338.4
Migraine	346.0–346.9
Tension headache	307.81
Arthritis or joint pain	710.0–719.9
Dorsopathies or back pain	720.0–724.9
Arthritis or joint pain	725.0–729.9

Didem Bernard, Steven R. Machlin, Zhengyi Fang, and Joel Cohen, *Average Annual Opioid Use Among Adults Treated for Conditions Associated with Chronic Pain Versus Other Conditions, 2013–2015*, Rockville, Md.: Agency for Healthcare Research and Quality, Research Findings No. 43, August 2019.

Study Objective

Examine the prevalence of opioid use among adults by various medical condition groupings using Medical Expenditure Panel Survey data.

Population

Civilian

Chronic Pain Definition

- Individuals were considered to have chronic pain if they had at least one medical encounter in any setting with a qualifying chronic pain ICD-9 diagnosis in a calendar year.
- Used the same list of ICD-9 pain codes as Tian, Zlateva, and Anderson (2013) but combined the “likely” and “highly likely” codes.

Jennifer Brennan Braden, Ming-Yu Fan, Mark J. Edlund, Bradley C. Martin, Andrea DeVries, and Mark D. Sullivan, “Trends in Use of Opioids by Noncancer Pain Type 2000–2005 Among Arkansas Medicaid and HealthCore Enrollees: Results from the TROUP Study,” *Journal of Pain*, Vol. 9, No. 11, November 2008, pp. 1026–1035.

Study Objective

Examine trends in opioid prescribing for the most common noncancer chronic pain conditions.

Population

Civilian

Chronic Pain Definition

- Individuals were considered to have chronic pain if they had at least one qualifying chronic pain ICD-9 diagnosis in a calendar year.

- The specific ICD-9 codes used were not published, but they corresponded to diagnoses of back pain, neck pain, joint pain, and headache/migraine.
- Individuals were excluded if they had a cancer diagnosis or were enrolled in hospice.

Cecile M. Denis, Knashawn H. Morales, Qufei Wu, David S. Metzger, and Martin D. Cheatele, "Association Between Diagnoses of Chronic Noncancer Pain, Substance Use Disorder, and HIV-Related Outcomes in People Living with HIV," *Journal of Acquired Immune Deficiency Syndromes*, Vol. 82, Suppl. 2, December 2019, pp. S142–S147.

Study Objective

Use electronic health record (EHR) data to describe chronic pain diagnoses, pain treatment, substance use disorder, and HIV-related outcomes among people living with HIV.

Population

Civilian

Chronic Pain Definition

- Individuals were considered to have chronic noncancer pain if they had at least one pain-related ICD-10 code at any point in the study period (see Table A.2).
- It is unclear what exclusion criteria were applied.

Table A.2

ICD-9 and ICD-10 Diagnosis Codes for Chronic Pain Clusters in Denis et al., 2019

Diagnostic Cluster	ICD-9 Diagnosis Codes	ICD-10 Diagnosis Codes
Musculoskeletal pain	719.40, 719.41, 719.42, 719.43, 719.44, 719.45, 719.46, 719.47, 719.48, 719.49, 723.1, 729.5, 723.1, 724.1, 724.2, 724.3, 724.4, 724.5, 725.4	M25.50, M25.519, M25.511, M25.512, M25.521, M25.522, M25.529, M25.531, M25.532, M25.539, M79.646, M25.551, M25.552, M25.559, M25.561, M25.562, M25.569, M25.571, M25.572, M25.579, M79.601, M79.602, M79.603, M79.604, M79.605, M79.606, M79.609, M79.621, M79.622, M79.629, M79.631, M79.632, M79.639, M79.641, M79.642, M79.643, M79.644, M79.645, M79.646, M79.651, M79.652, M79.659, M79.661, M79.662, M79.669, M79.671, M79.672, M79.673, M79.674, M79.675, M79.676, M51.1, M54.10, M54.11, M54.12, M54.13, M54.14, M54.15, M54.16, M54.17, M54.18, M54.2, M54.30, M54.31, M54.32, M54.40, M54.41, M54.42, M54.5, M54.6, M54.82, M54.89, M54.9
Neuralgia, neuritis, radiculopathy, and facial pain	350.1, 350.2, 350.8, 350.9, 723.4, 729.2	B02.22, G50.0, G50.1, M54.10, M79.2
Fibromyalgia	729.1	M79.7
Causalgia and chronic pain	338.21, 338.22, 338.28, 338.29, 338.4, 355.9, 337.20, 337.22, 337.29, 337.21, 355.71, 354.4, 338.0	G54.6, G56.40, G56.41, G56.42, G56.43, G57.70, G57.71, G57.72, G57.73, G89.0, G89.21, G89.22, G89.28, G89.29, G89.4, G90.50, G90.511, G90.512, G90.513, G90.519, G90.521, G90.522, G90.523, G90.529, G90.59

Samah Jamal Fodeh, Dezon Finch, Lina Bouayad, Stephen L. Luther, Han Ling, Robert D. Kerns, and Cynthia Brandt, "Classifying Clinical Notes with Pain Assessment Using Machine Learning," *Medical and Biological Engineering and Computing*, Vol. 56, No. 7, July 2018, pp. 1285–1292.

Study Objective

Use narrative text data from the EHR to characterize pain assessment.

Population

Civilian

Chronic Pain Definition

- Individuals were considered to have chronic pain if they had at least one qualifying chronic musculoskeletal pain ICD-9 diagnosis in a calendar year and a pain intensity rating of 4 or higher.
- Specific ICD codes used were not published.

Patricia M. Herman, Anita H. Yuan, Matthew S. Cefalu, Karen Chu, Qing Zeng, Nell Marshall, Karl A. Lorenz, and Stephanie L. Taylor, "The Use of Complementary and Integrative Health Approaches for Chronic Musculoskeletal Pain in Younger US Veterans: An Economic Evaluation," *PLoS One*, Vol. 14, No. 6, June 5, 2019, article e0217831.

Study Objective

Cost-effectiveness study of the use of complementary and integrative health approaches for musculoskeletal pain in younger veterans, using EHR data.

Population

Veterans

Chronic Pain Definition

- Used a modified version of Tian, Zlateva, and Anderson's (2013) algorithm (ICD-9 "likely" codes only).

Chandrashekar Janakiram, Paul Fontelo, Vojtech Huser, Natalia I. Chalmers, Gabriela Lopez Mitnik, Avery R. Brow, Timothy J. Iafolla, and Bruce A. Dye, "Opioid Prescriptions for Acute and Chronic Pain Management Among Medicaid Beneficiaries," *American Journal of Preventive Medicine*, Vol. 57, No. 3, September 2019, pp. 365–373.

Study Objective

Examine opioid prescribing patterns for acute and chronic pain management using Medicaid claims data.

Population

Civilian

Chronic Pain Definition

- Individuals were considered to have pain if they had at least one qualifying ICD-9 diagnosis at an outpatient visit between 2013 and 2015 (see Table A.3).
- Diagnostic groups corresponding to acute pain: ear, nose, and throat (ENT); dental; and orthopedic.
- Diagnostic groups corresponding to chronic pain: back pain, neck pain, joint pain, and headache.

Table A.3
ICD-9 Diagnosis Codes for Chronic Pain Clusters in Janakiram et al., 2019

Diagnostic Clusters	ICD-9 Diagnosis Codes
ENT, including otalgia	388.70, 388.71, 388.72
Dental-related conditions	520.0–529.9, except 524.60, 524.64, 524.69
Orthopedics—sprains, fractures	810.00–819.00, 820.00–829.00, 840.00–848.00
Back pain	724.5
Neck pain	723.1
Headache—cluster headaches, chronic headache, and migraine pain	339.00, 339.01, 339.02, 346.0, 346.9, 346.1, 346.7, 784.0
Joint pain—osteoarthritis and rheumatoid arthritis	714.0, 715.00–715.98

Lily H. Kim, Daniel Vail, Tej D. Azad, Jason P. Bentley, Yi Zhang, Allen L. Ho, Paras Fatemi, Austin Feng, Kunal Varshneya, Manisha Desai, Anand Veeravagu, and John K. Ratliff, “Expenditures and Health Care Utilization Among Adults with Newly Diagnosed Low Back and Lower Extremity Pain,” *Journal of the American Medical Informatics Association*, Vol. 2, No. 5, May 2019, article e193676.

Study Objective

Examine health care utilization by patients with new back and lower extremity pain using commercial claims data.

Population

Civilian

Definition of New Episode of Pain

- The initial pain visit was defined as the first visit at which an enrollee had an ICD-9 or ICD-10 code for low back pain or lower extremity pain, and also did not have any such diagnosis codes for 12 months prior to the designated initial pain visit (see Table A.4).
- Patients with cancer, or those who exhibited “red-flag” symptoms (e.g., cauda equina syndrome) within 12 months before or after their initial pain visit, or who received an opioid prescription six months prior to the initial pain visit, were excluded.

Table A.4
ICD-9 and ICD-10 Diagnosis Codes for Chronic Pain Clusters in Kim et al., 2019

Diagnostic Clusters	ICD-9 Diagnosis Codes	ICD-10 Diagnosis Codes
Lumbosacral spondylosis without myelopathy	721.3	M47.817
Thoracic or lumbar spondylosis with myelopathy	721.4	M47.14, M47.16
Displacement of lumbar or lumbosacral intervertebral disc	722.1	M51.26, M51.27
Degeneration of lumbar or lumbosacral intervertebral disc	722.52	M51.36, M51.37
Lumbago	724.2	
Sciatica	724.3	M54.30
Thoracic or lumbosacral neuritis or radiculitis, unspecified	724.4	
Backache, unspecified	724.5	
Spondylolysis, site unspecified	738.4	M43.00
Spondylolisthesis, site unspecified		M43.10
Radiculopathy (thoracic, thoracolumbar, lumbar, or lumbosacral)		M54.14–M54.17
Dorsalgia		M54.89, M54.9

Jennifer Malon, Parth Shah, Woon Yuen Koh, Gary Cattabriga, Edward Li, and Ling Cao, "Characterizing the Demographics of Chronic Pain Patients in the State of Maine Using the Maine All Payer Claims Database," *BMC Public Health*, Vol. 18, No. 1, June 28, 2018, article 810.

Study Objective

Determine the prevalence of chronic pain in Maine using all payer claims data.

Population

Civilian

Chronic Pain Definition

- Used a modified version of Tian, Zlateva, and Anderson's (2013) algorithm (i.e., ICD-9 codes or receipt of an opioid prescription required to meet criteria for chronic pain).

Ashli A. Owen-Smith, Brian K. Ahmedani, Ed Peterson, Gregory E. Simon, Rebecca C. Rossom, Frances L. Lynch, Christine Y. Lu, Beth E. Waitzfelder, Arne Beck, Lynn L. DeBar, Yousef Maaz, Shehryar Khan, Lisa R. Miller-Mateo, Deepak Prabhakar, Cathy Frank, Christopher L. Drake, and Jordan M. Braciszewski, "The Mediating Effect of Sleep Disturbance on the Relationship Between Nonmalignant Chronic Pain and Suicide Death," *Pain Practice*, Vol. 19, No. 4, April 2019, pp. 382–389.

Study Objective

Examine whether sleep disturbances mediate the relationship between chronic noncancer pain and suicide.

Population

Civilian

Chronic Pain Definition

- Individuals were considered to have chronic pain if they had at least two ICD-9 diagnoses from the same chronic pain diagnosis "cluster," recorded between three and 12 months apart (see Table A.5).
- Individuals with cancer diagnoses were excluded.

Table A.5
ICD-9 Diagnosis Codes for Chronic Pain Clusters in Owen-Smith et al., 2019

Diagnostic Cluster	ICD-9 Diagnosis Codes
Back pain	720.0–724.9
Fibromyalgia	729.1
Migraine	346
Psychogenic pain	307.8, 307.89
Neuropathy	350.0–350.9, 356.0–356.9
Other headache	339.0–339.9
Arthritis	714.0–716.9

Sharon Reif, Rachel Sayko Adams, Grant A. Ritter, Thomas V. Williams, and Mary Jo Larson, "Prevalence of Pain Diagnoses and Burden of Pain Among Active Duty Soldiers, FY2012," *Military Medicine*, Vol. 183, Nos. 9–10, 2018, pp. e330–e337.

Study Objective

Describe the prevalence of ten painful conditions among active-duty soldiers, reported pain levels, duration of pain, and impact of pain on military duty limitations.

Population

Military

Chronic Pain Definition

- Soldiers were considered to have chronic pain if they had at least two encounters with diagnoses from the same primary pain category at least three months apart.
- Pain categories were defined based on the presence of either ICD-9-CM diagnosis codes or Clinical Classifications Software (CCS) code groupings (see Table A.6).

Table A.6
ICD-9 and CSS Diagnosis Codes for Chronic Pain Clusters in Reif et al., 2018

Diagnostic Categories	ICD-9 Diagnosis Codes	CCS Diagnosis Codes
Peripheral/central nervous system	053.13, 072.72, 337.0, 337.1, 353–357, 377.33, 377.34, 377.41	
Osteoarthritis		203
Back and neck		
Back—lumbago		13.3.3.3
Back and neck—intervertebral disc		13.3.2
Back and neck—cervicalgia	723.1	
Back and neck—spondylosis		13.3.1
Back and neck—other	Excluding 723.1	Remainder of 205 (13.3.3.1, 13.3.3.2, 13.3.3.4, 13.3.3.5, 13.3.3.6, 13.3.3.7)
Headache/migraine		84
Non-traumatic joint disorders		204
Other musculoskeletal	711.x(1–3), 712.x(1–3), 715.x(1–3), 716.x(2–3), 718 4th digit (0, 1, 4, 5, 8) and 5th digit (1–3), 719.x, 721.0x, 721.1x, 722.0x, 722.31, 722.4, 722.71, 722.81, 722.91, 723.xx, 725, 726 (excluding 726.70, 726.73, 726.79, 726.91), 727.61–727.62, 728.11, 728.12, 728.81, 728.83, 728.86, 728.89, 728.9, 729 (excluding 729.2, 729.3, 729.6, 729.81, 729.82), 730.x(1–3), 781.99, 830–848, 905.6, 905.7, V43.6, V43.7, V48.3, V49.6, V49.7	202
Visceral/pelvic	550 (except 550.9), 551.0–551.2, 552.0–552.2, 560.81, 562.01, 562.03, 562.11, 562.13, 567.2, 567.8, 569.5, 574, 575.0, 575.1, 577.0, 577.1, 592, 594, 596, 614, 615, 616.11, 616.2–616.9, 617, 625.1–625.3, 625.5, 625.7, 625.8, 626.3, 626.5, 788.0, 789.0, 789.6	251
Wounds/injury/fractures	353.6, 376.47, 733.1, 733.93–733.98, 800–829, 860–887 (except 873.63), 890–897, 900–904, 905.0–905.5, 905.8, 905.9, 906, 907.2, 908.0–908.4, 925–929, 940–949, 952, 997.6, V13.51, V13.52, V49.6, V49.7, V54.0–V54.2, V66.4, V67.4,	
Acute	338.11, 338.12, 338.18, 338.19	
Chronic nonspecific	338.21, 338.28, 338.29, 338.4, 780.96	

Terrence Y. Tian, Ianita Zlateva, and Daren R. Anderson, "Using Electronic Health Records Data to Identify Patients with Chronic Pain in a Primary Care Setting," *Journal of the American Medical Informatics Association*, Vol. 20, No. e2, December 2013, pp. e275–e280.

Study Objective

Develop, validate, and compare various approaches to identifying chronic pain using administrative data available in EHRs.

Population

Civilian

Chronic Pain Definition

- The authors compared several sets of criteria for chronic pain, each based on a different combination of data elements available in the EHRs.
- Three sets of criteria used administrative data elements only.
 - First set of criteria: Patients were considered to have chronic pain if they had at least one medical visit in the preceding year with a single occurrence of a "highly likely" pain-related ICD-9 code (see Table A.7). When benchmarked against a chart review, accuracy was 83 percent (sensitivity: 20 percent; specificity: 99 percent).
 - Second set of criteria: Patients were considered to have chronic pain if they had at least two occurrences of a "likely" pain-related ICD-9 code in the preceding year (see Table A.1), separated by at least 30 days. When benchmarked against a chart review, accuracy was 93 percent (sensitivity: 71 percent; specificity: 99 percent).
 - Third set of criteria: Patients were considered to have chronic pain if they received at least 90 days of opioid analgesics. When benchmarked against a chart review, accuracy was 84 percent (sensitivity: 20 percent; specificity: 100 percent).
- Patients with cancer diagnoses were excluded.

Table A.7
ICD-9 Diagnosis Codes for Chronic Pain in Tian, Zlateva, and Anderson, 2013

Diagnosis Category	ICD-9 Diagnosis Codes
ICD-9 codes highly likely to represent chronic pain	338.2, 338.21, 338.22, 338.28, 338.29, 338.4
ICD-9 codes likely to represent chronic pain	307.8, 307.89, 338, 719.41, 719.49, 719.45, 719.46, 719.47, 720, 720.2, 720.9, 721, 721.1, 721.2, 721.3, 721.41, 721.42, 721.6, 721.8, 721.9, 721.91, 722, 722.1, 722.11, 722.2, 722.3, 722.31, 722.32, 722.39, 722.4, 722.51, 722.52, 722.6, 722.7, 722.71, 722.73, 722.8, 722.81, 722.82, 722.83, 722.9, 722.91, 722.92, 722.93, 723, 723.1, 723.3, 723.4, 723.5, 723.6, 723.7, 723.8, 723.9, 724, 724.01, 724.02, 724.09, 724.1, 724.2, 724.3, 724.4, 724.5, 724.6, 724.7, 724.79, 724.8, 724.9, 729, 729.1, 729.2, 729.4, 729.5

Marcello Tonelli, Natasha Wiebe, Martin Fortin, Bruce Guthrie, Brenda R. Hemmelgarn, Matthew T. James, Scott W. Klarenbach, Richard Lewanczuk, Braden J. Manns, Paul Ronksley, Peter Sargious, Sharon Straus, and Hude Quan, "Methods for Identifying 30 Chronic Conditions: Application to Administrative Data," *BMC Medical Informatics and Decision Making*, Vol. 15, April 17, 2015, article 31.

Study Objective

Use validated algorithms to determine the prevalence of chronic conditions in claims data.

Population

Civilian

Chronic Pain Definition

- Used modified version of Tian, Zlateva, and Anderson's (2013) algorithm (i.e., used ICD-9 codes, combined "highly likely" and "likely" codes and required two occurrences of each pain code in 30 days or less).

Michael Von Korff, Ann I. Scher, Charles Helmick, Olivia Carter-Pokras, David W. Dodick, Joseph L. Goulet, Robin Hamill-Ruth, Linda LeResche, Linda Porter, Raymond Tait, Gregory Terman, Christin Veasley, and Sean Mackey, "United States National Pain Strategy for Population Research: Concepts, Definitions, and Pilot Data," *Journal of Pain*, Vol. 17, No. 10, October 2016, pp. 1068–1080.

Study Objective

Describe pain-related health care using electronic health record data.

Population

Civilian

Chronic Pain Definition

- Individuals were considered to have chronic pain if they had at least 12 visits in the preceding two years with pain-related ICD-9 diagnoses from any of 11 diagnostic groups (see Table A.8).
- Individuals were excluded if they had a cancer diagnosis, if they were in hospice, or if they received two or more opioid prescriptions from an oncologist in the preceding year.

Table A.8
ICD-9 Diagnosis Codes for Chronic Pain in Von Korff et al., 2016

Diagnosis Category	ICD-9 Diagnosis Codes
Back pain	720.x, 721.2, 721.3, 721.41, 721.42, 721.5, 721.6, 721.7, 721.8, 721.9, 721.90, 721.91, 722.1, 722.10, 722.11, 722.2, 722.3, 722.30, 722.31, 722.32, 722.39, 722.5, 722.51, 722.52, 722.6, 722.7, 722.70, 722.71, 722.72, 722.73, 722.8, 722.80, 722.82, 722.83, 722.9, 722.90, 722.92, 722.93, 724, 724.0, 724.00, 724.01, 724.02, 724.09, 724.1, 724.2, 724.3, 724.4, 724.5, 724.6, 724.7, 724.70, 724.71, 724.79, 724.8, 724.9, 737, 737.x, 737.1, 737.12, 737.2, 737.29, 737.3, 737.39, 737.43, 737.9, 738.4, 738.5, 739.2, 739.3, 739.4, 756.1, 756.11, 756.12, 756.13, 756.15, 756.16, 756.17, 756.19, 805, 805.2, 805.4, 805.6, 805.8, 839.2, 839.20, 839.21, 839.42, 846, 846.0, 846.1, 846.2, 846.3, 846.8, 846.9, 848.5, 847.1, 847.2, 847.3, 847.4, 847.9
Neck pain	721, 721.0, 721.1, 722, 722.0, 722.4, 722.81, 722.91, 723.x, 728.85, 739.1, 805.0, 805.00, 805.01, 805.02, 805.03, 805.04, 805.05, 805.06, 805.07, 805.08, 847, 847.0
Limb and extremity pain, arthritic disorders, and pain in joints	003.23, 003.24, 026.1, 036.82, 056.71, 274.0, 274.00, 274.01, 274.02, 274.03, 274.1, 274.11, 274.19, 274.81, 274.82, 274.89, 274.9, 354, 354.0, 354.00, 354.4, 713.5, 715.x, 717.2, 717.3, 717.5, 717.7, 717.83, 717.9, 718.1, 718.31, 718.45, 718.46, 718.47, 718.51, 718.81, 718.84, 718.87, 719, 719.06, 719.4, 719.4, 719.41, 719.42, 719.43, 719.44, 719.45, 719.46, 719.47, 719.48, 719.49, 723.4, 724.03, 724.3, 726, 726.0, 726.1, 726.10, 726.11, 726.12, 726.19, 726.2, 726.3, 726.30, 726.31, 726.32, 726.33, 726.39, 726.4, 726.5, 726.6, 726.6, 726.61, 726.62, 726.64, 726.65, 726.69, 726.7, 726.70, 726.71, 726.72, 726.73, 726.79, 726.8, 726.9, 726.90, 726.91, 727.51, 727.6, 727.60, 727.61, 727.62, 727.63, 727.64, 727.65, 727.66, 727.67, 727.68, 727.69, 728.71, 729.2, 729.5, 739.6, 739.7, 755.67, 755.9, 831, 831.01, 835, 836, 836.1, 836.3, 838.04, 839.69, 839.8, 840, 840.3, 840.4, 840.5, 840.6, 840.7, 840.8, 841.9, 842, 842.01, 842.09, 844.1, 844.2, 711.x, 727.0x, 727.1x, 727.2x, 727.3x, 727.4x, 727.5x, 727.8x, 727.9x, 714, 714.8, 714.89, 719.3, 730, 730.0, 730.00, 730.01, 730.02, 730.03, 730.04, 730.05, 730.06, 730.07, 730.08, 730.09, 730.1, 730.11, 730.12, 730.13, 730.14, 730.15, 730.16, 730.17, 730.18, 730.19, 730.2, 730.21, 730.22, 730.23, 730.24, 730.25, 730.26, 730.27, 730.28, 730.29, 730.3, 730.31, 730.32, 730.33, 730.34, 730.35, 730.36, 730.37, 730.38, 730.39, 730.7, 730.71, 730.72, 730.73, 730.74, 730.75, 730.76, 730.77, 730.78, 730.79, 730.8, 730.81, 730.82, 730.83, 730.84, 730.85, 730.86, 730.87, 730.88, 730.89, 730.9, 730.91, 730.92, 730.93, 730.94, 730.95, 730.96, 730.97, 730.98, 730.99, 731.2, 714.0x, 714.1x, 714.2x, 714.3x, 714.4x, 714.9x, 716.x, 274, 712.1, 712.11, 712.12, 712.13, 712.14, 712.15, 712.16, 712.17, 712.18, 712.19, 712.2, 712.21, 712.22, 712.23, 712.24, 712.25, 712.26, 712.27, 712.28, 712.29, 712.3, 712.31, 712.32, 712.33, 712.34, 712.35, 712.36, 712.37, 712.38, 712.39, 712.8, 712.81, 712.82, 712.83, 712.84, 712.85, 712.86, 712.87, 712.88, 712.89, 712.9, 712.91, 712.92, 712.93, 712.94, 712.95, 712.96, 712.97, 712.98, 712.9
Fibromyalgia and widespread muscle pain	725, 729, 729.1, 307.89, 338, 338.2, 338.21, 338.22, 338.28, 338.29, 338.4, 780.96, 739.9, 780.9
Headache	307.81, 339, 339.0, 339.00, 339.01–03, 339.03–0.4, 339.05, 339.09, 339.1x, 339.2x, 339.3, 339.4, 339.41, 339.42, 339.43, 339.44, 339.81, 339.82, 339.83, 339.84, 339.85, 339.89, 346.xx, 784, 784.0
Orofacial pain, ear pain, and temporomandibular disorder pain	524.6x, 526.9x, 784.9x, 830.0x, 830.1x
Abdominal and bowel pain	550.x, 551.x, 552.x, 553.x, 789.0x, 564.1, 574.x, 592.x
Chest pain	413, 413.0, 413.1, 413.9, 733.6, 786.5, 786.50, 786.52, 786.59
Urogenital pain and menstrual pain	625.0x, 625.1x, 625.2x, 625.3x, 625.4x, 625.5x, 625.7x, 625.8x, 625.9x, 625, 098.12, 098.32, 131.03, 595x, 601.0, 601.1, 601.4, 601.9

Table A.8—Continued

Diagnosis Category	ICD-9 Diagnosis Codes
Fractures, contusions, sprains, and strains	716.11, 716.1, 716.12, 716.13, 716.14, 716.15, 716.16, 716.17, 716.18, 716.19, 717, 717.1, 717.2, 717.3, 717.4, 717.41, 717.42, 717.43, 717.49, 717.5, 717.6, 717.7, 717.81, 717.82, 717.83, 717.84, 717.85, 717.89, 717.9, 718, 718.01, 718.02, 718.03, 718.04, 718.05, 718.07, 718.08, 718.09, 718.3, 718.31, 718.32, 718.33, 718.34, 718.35, 718.36, 718.37, 718.38, 718.39, 733.1, 733.10, 733.11, 733.12, 733.13, 733.14, 733.15, 733.16, 733.19, 733.93, 733.94, 733.95, 733.96, 733.97, 733.98, 830, 830.1, 831, 831.01, 831.02, 831.03, 831.04, 831.09, 831.1, 831.11, 831.12, 831.13, 831.14, 831.19, 832, 832.01, 832.02, 832.03, 832.04, 832.09, 832.1, 832.11, 832.12, 832.13, 832.14, 832.19, 832.2, 833, 833.01, 833.02, 833.03, 833.04, 833.05, 833.09, 833.1, 833.11, 833.12, 833.13, 833.14, 833.15, 833.19, 834, 834.01, 834.02, 834.1, 834.11, 834.12, 835, 835.01, 835.02, 835.03, 835.1, 835.11, 835.12, 835.13, 836, 836.1, 836.2, 836.3, 836.4, 836.5, 836.51, 836.52, 836.53, 836.54, 836.59, 836.6, 836.61, 836.62, 836.63, 836.64, 836.69, 837, 837.1, 838, 838.01, 838.02, 838.03, 838.04, 838.05, 838.06, 838.09, 838.1, 838.11, 838.12, 838.13, 838.14, 838.15, 838.16, 838.19, 839, 839.01, 839.02, 839.03, 839.04, 839.05, 839.06, 839.07, 839.08, 839.1, 839.11, 839.12, 839.13, 839.14, 839.15, 839.16, 839.17, 839.18, 839.2, 839.21, 839.3, 839.31, 839.4, 839.41, 839.42, 839.49, 839.5, 839.51, 839.52, 839.59, 839.61, 839.69, 839.71, 839.79, 839.8, 839.9, 905.6, 800.x, 801.x, 802.x, 803.x, 804.x, 805.x, 806.x, 807.x, 808.x, 809.x, 810.x, 811.x, 812.x, 813.x, 814.x, 815.x, 816.x, 817.x, 818.x, 819.x, 820.x, 821.x, 822.x, 823.x, 824.x, 825.x, 826.x, 827.x, 828.x, 829.x, 920.x, 921.x, 922.x, 923.x, 924.x, 840, 840.1, 840.2, 840.3, 840.4, 840.5, 840.6, 840.7, 840.8, 840.9, 841, 841.1, 841.2, 841.3, 841.8, 841.9, 842, 842.01, 842.02, 842.09, 842.1, 842.11, 842.12, 842.13, 842.19, 843, 843.1, 843.8, 843.9, 844, 844.1, 844.2, 844.3, 844.8, 844.9, 845, 845.01, 845.02, 845.03, 845.09, 845.1, 845.11, 845.12, 845.13, 845.19, 846, 846.1, 846.2, 846.3, 846.8, 846.9, 847, 847.1, 847.2, 847.3, 847.4, 847.9, 848, 848.1, 848.2, 848.3, 848.4, 848.41, 848.42, 848.49, 848.5, 848.8, 848.9, 905.7
Other painful conditions	718.4, 718.41, 718.42, 718.43, 718.44, 718.45, 718.46, 718.47, 718.48, 718.49, 727.1, 734, 735, 735.1, 735.2, 735.3, 735.4, 735.5, 735.8, 735.9, 736, 736.01, 736.02, 736.03, 736.04, 736.05, 736.06, 736.07, 736.09, 736.1, 736.2, 736.21, 736.22, 736.29, 736.3, 736.31, 736.32, 736.39, 736.41, 736.42, 736.5, 736.6, 736.7, 736.71, 736.72, 736.73, 736.74, 736.75, 736.76, 736.79, 736.81, 736.89, 736.9, 738, 738.0, 738.1, 738.1, 738.1, 738.11, 738.12, 738.19, 738.2, 738.3, 738.6, 738.7, 738.8, 738.9, 282.41, 282.42, 282.5, 282.6, 282.60, 282.63, 282.64, 282.68, 282.69, 349.39, 806, 806.01, 806.02, 806.03, 806.04, 806.05, 806.06, 806.07, 806.08, 806.09, 806.1, 806.11, 806.12, 806.13, 806.14, 806.15, 806.16, 806.17, 806.18, 806.19, 806.2, 806.21, 806.22, 806.23, 806.24, 806.25, 806.26, 806.27, 806.28, 806.29, 806.3, 806.31, 806.32, 806.33, 806.34, 806.35, 806.36, 806.37, 806.38, 806.39, 806.4, 806.5, 806.6, 806.61, 806.62, 806.69, 806.7, 806.71, 806.72, 806.79, 806.8, 806.9, 907.2, 952, 952.01, 952.02, 952.03, 952.04, 952.05, 952.06, 952.07, 952.08, 952.09, 952.1, 952.11, 952.12, 952.13, 952.14, 952.15, 952.16, 952.17, 952.18, 952.19, 952.2, 952.3, 952.4, 952.8, 952.9, 710, 710.0, 710.1, 710.2, 710.3, 710.4, 710.8, 710.9, 88.81, 337, 337.0, 337.09, 337.1, 353.x, 354.x, 355.x, 356.x, 357.x, 377.33, 377.34, 377.4