**APPENDIX**

**Cohort Design**

We identified visits using codes for back symptoms, back pain/ache/soreness/discomfort, low back cramps, contractures, spasms, limitation of movement of/stiffness of the back, low back symptoms, low back pain/ache/soreness/discomfort, sprain and strain of cervical spine, sprain and strain of back, injury, other and unspecified of back*.* Similarly, we used ICD-9-CM codes to identify visits where a diagnosis of back or neck pain was made (Table A2). Relevant diagnoses included spinal enthesopathy (720.1), spinal spondylosis (721.0-721.9), intravertebral disc disorders (722.0-722.9), other disorders of cervical region (723.0-723.8), other and unspecified disorders of back (724.0-724.9), curvature of spine (737.0-737.9), nonallopathic lesions (739.0-739.4, or spine related), anomalies of spine (756.1), sprains and strains of sacroiliac region (846.0-846.9), and sprains and strains of neck (847.0-847.9).1

**Medications**

Muscle relaxants included carisoprodol, orphenadrine, chlorzoxazone, cyclobenzaprine, metaxalone, methocarbamol, and tizanidine. Agents to treat “neuropathic” pain included gabapentin, pregabalin, topiramate, amitritpyline, amoxapine, clomipramine, desipramine, doxepin, imipramine, nortriptyline, and protriptylines.

**Imaging**

During the years 2001-2004, the CT/MRI variable was removed from the survey instrument and replaced with a variable that captured all “other imaging” (which could include studies such as ultrasound; however, ultrasound exams occurred less than 20 times per year in our sample). When we removed the years 2001-2004, the trend for CT/MRI remained unchanged (see Table A4) so we included all years in our results. During 2007-2010, MRI and CT were reported separately so these were combined for analyses.

**Tables**

Table A1 outlines the construction of the cohort, revealing that patients with primary reasons for visits (chief complaint) of back or neck pain comprised the largest subgroup (32%). Table A2 presents the proportions of diagnostic codes over time. Other and unspecified disorders of the back comprised the most frequent diagnostic code, increasing from 41% in 1999-2000 to 57% in 2009-2010. The proportions do not add to 100% because a minority of patients had chief complaints of back or neck pain, but no corresponding back or neck pain diagnostic code. The majority of these patients instead had relevant but non-specific codes such as pain in joint of site unspecified or osteoarthrosis, multiple sites. The overall increase in the percentage of diagnoses over time may be due to the increased attention paid to accurate billing over the past decade.

After removing competing diagnoses with similar treatments to back or neck pain (e.g. knee pain) from the analysis, we observed similar trends (Table A3) compared to the entire cohort. Therefore we kept these visits in the main analysis. Table A4 outlines trends in CT/MRI use in the cohort using only the years that the CT/MRI variable was available, and trends are similar to the main analysis, which substitutes the “other imaging” variable from 2001-2004. Table A5 outlines year-by-year trends of patient visit characteristics. Table A6 indicates trends in comorbid conditions from 2005-2010, with only asthma significantly changing from 3.6% to 6.5% (p<.01). Table A7 is discussed in the results section and presents the results of multivariable logistic regression models estimating use of CT/MRI studies, referrals to physicians, and narcotic prescriptions with visits pooled over the entire study period. The most notable findings were that Black, Hispanic, and other race/ethnicity patients had lower odds of receiving narcotics (0.77, 95% CI [0.65, 0.92], 0.60 [0.39, 0.95], and 0.51 [0.40, 0.65], respectively), as did female patients (0.86 [0.77, 0.96]).

Tables A8 and A9 compare recommendations and strength of evidence from various major clinical guidelines.2,3,4,5,6,7,8 On the whole, the guidelines remain consistent with few exceptions, such as narcotics recommended with caveats for acute back pain in ACP/ACR and Institute for Clinical Systems Improvement guidelines (both based in the U.S.), but not in the European guidelines. Recommended therapies such as NSAIDs/acetaminophen and physical therapy had fairly good data supporting their use, however, narcotic use tended to have relatively inferior evidence behind their guarded recommendations of use, which may explain some of the variability over time. On the other hand, recommendations against routine imaging had fairly good evidence across the board and were consistent over time. Finally, Table A10 compares trends between NAMCS and NHAMCS and confirms similar trends across the two datasets.

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| **Table A1.** Cohort Design |
| **Group** | **Description** | **Sample n (%)** |
| 1 | Primary reason for visit due to new onset (<3 months duration) or acute on chronic back or neck pains | 7,548 (32) |
| 2 | Both non-primary complaint and non-primary diagnosis of back or neck pain and competing diagnoses are absent | 2,013 (8.4) |
| 3 | Primary complaint of back or neck pain during chronic routine, pre/post, or general/preventative visit and without competing diagnoses | 3,686 (13) |
| 4 | Primary diagnosis of back or neck pain without a complaint and without competing diagnoses | 5,960 (23) |
| 5 | Groups 2-4 and including competing diagnoses | 4,711 (23) |

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| **Table A2.** Proportions of Diagnostic Codes over Time\* |
| **ICD-9-CM Code** | **General Description** | **Percentage in 1999-2000** | **Percentage in 2009-2010** |
| 720.1 | Spinal enthesopathy | 0 | 0 |
| 721.0-721.9 | Spondylosis and allied disorders (excluding myelopathy) | 4.5 | 6.2 |
| 722.0-722.9 | Intervertebral disc disorders (excluding myelopathy and postlaminectomy syndrome) | 8.5 | 11 |
| 723.0-723.8 | Other disorders of cervical region (excluding traumatic causes)b | 10 | 13 |
| 724.0-724.9 | Other and unspecified disorders of back (excluding sacroillitis, specified lesion of sciatic nerve, collapsed vertebra (e.g. due to osteoporosis) | 41 | 57 |
| 737.0-737.9 | Curvature of spine (excludes Pott's disease, Charcot-Marie-Tooth disease, neurofibromatosis, and other congenital causes) | 1.1 | 1.9 |
| 739.1-739.4 | Nonallopathic lesions, not elsewhere classified (including only cervical, thoracic, lumbar, and sacral regions) | 1.4 | 2.4 |
| 756.1 | Anomalies of the spine (excluding spina bifida) | 0.84 | 1.3 |
| 846.0-846.9 | Sprains and strains of sacroiliac region | 6.3 | 2.2 |
| 847.0-847.9 | Sprains and strains of neck (includes thoracic, lumbar, sacral, coccyx, and unspecified sites of back) | 0.95 | 1.3 |

\*Our results included patients with radiculopathy. Despite common misperceptions among physicians, guideline-recommended management of radiculopathy such as sciatica (short of severe neurologic symptoms) does not significantly differ from non-specific back pain.9

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| **Table A3.** Unadjusted Proportions of Utilization over Time Without Competing Diagnoses (e.g. pain in limb, spasm of muscle) |
| **Year (sample n)** | **1999-2000 (n=2,417)** | **2001-2002 (n**=**2,767)** | **2003-2004 (n=2,894)** | **2005-2006 (n=2,979)** | **2007-2008 (n=3,263)** | **2009-2010 (n=2,997)** | **P-value\*** |
| **Medications** |  |  |  |  |  |  |  |
| Narcotics  | 19 | 21 | 23 | 26 | 35 | 29 | <.001 |
| Tramadol | 3.4 | 3.0 | 1.2 | 3.0 | 4.4 | 5.0 | .073 |
| Neuropathic | 4.0 | 4.0 | 4.4 | 5.0 | 11 | 8.0 | <.001 |
| Benzo/Relaxant | 19 | 22 | 23 | 22 | 26 | 24 | <.001 |
| NSAIDs/APAP | 37 | 31 | 33 | 29 | 27 | 25 | <.001 |
| **Referrals** |  |  |  |  |  |  |  |
| Physical Therapy | 20 | 13 | 17 | 15 | 14 | 19 | .92 |
| Other Physician | 6.1 | 11 | 11 | 11 | 15 | 14 | <.001 |
| **Imaging** |  |  |  |  |  |  |  |
| X-Ray | 17 | 14 | 13 | 16 | 16 | 16 | .36 |
| CT/MRI | 7.2 | 7.4 | 7.0 | 10 | 11 | 11 | <.001 |

\* P values are adjusted for age, sex, race/ethnicity, region, insurance type,, symptom duration/context, whether the provider was the PCP, and whether the visit was located in a metropolitan area.

Abbreviations: Benzo/Relaxant, benzodiazepines and muscle relaxant prescriptions; APAP, acetaminophen prescriptions; CT/MRI, computed tomography or magnetic resonance imaging.

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| **Table A4.** Unadjusted Percentages of CT/MRI Use Excluding 2001-2004 |
| **Year (sample n)** | **1999-2000 (n=3,350)** | **2005-2006 (n=4,090)** | **2007-2008 (n=4,562)** | **2009-2010 (n=4,078)** | **P-value\*** |
| CT/MRI  | 7.2 | 11 | 11 | 11 | .01 |

\* P value is adjusted for age, sex, race/ethnicity, region, insurance type, symptom duration/context, whether the provider was the PCP, and whether the visit was located in a metropolitan area.

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| **Table A5.** Patient Visit Characteristics Over Time |
| **Year (Sample n)** | **1999-2000 (n=3,350)** | **2001-2002 (n**=**3,882)** | **2003-2004 (n=3,956)** | **2005-2006 (n=4,090)** | **2007-2008 (n=4,562)** | **2009-2010 (n=4,078)** | **P-valuea** |
| Age (mean)  | 49 | 52 | 52 | 52 | 52 | 53 | .01 |
| Female Sex | 58 | 59 | 59 | 58 | 60 | 58 | .81 |
| Race/Ethnicityb |  |  |  |  |  |  |  |
| White | 77 | 83 | 79 | 75 | 76 | 77 | .01 |
| Black | 11 | 9.0 | 9.0 | 19 | 12 | 12 |  |
| Hispanic | 7.9 | 5.2 | 9.6 | 11 | 6.8 | 7.7 |  |
| Other | 3.3 | 3.7 | 2.6 | 3.5 | 5.0 | 3.6 |  |
| Insurance Status |  |  |  |  |  |  |  |
| Private  | 49 | 52 | 51 | 51 | 51 | 46 | .01 |
| Medicare | 17 | 24 | 23 | 22 | 23 | 28 |  |
| Medicaid | 6.8 | 5.9 | 8.1 | 11 | 10 | 9.2 |  |
| Workers' Comp | 15 | 10 | 7.8 | 7.7 | 6.0 | 7.9 |  |
| Uninsured | 11 | 7.9 | 11 | 7.6 | 10 | 9.0 |  |
| Identified PCP | 49 | 51 | 53 | 52 | 50 | 44 | .42 |
| Specialtyc |  |  |  |  |  |  |  |
| Primary Care | 56 | 56 | 66 | 59 | 59 | 54 | .29 |
| Neurology/Orthopedic Surgery | 18 | 18 | 15 | 21 | 15 | 16 |  |
| All other specialties | 26 | 26 | 20 | 20 | 26 | 30 |  |
| Metro Area | 84 | 83 | 86 | 86 | 86 | 88 | .76 |
| Region |  |  |  |  |  |  |  |
| Northeast | 21 | 23 | 30 | 20 | 21 | 18 | .42 |
| Midwest | 22 | 24 | 19 | 25 | 22 | 23 |  |
| South | 31 | 32 | 30 | 34 | 39 | 41 |  |
| West | 27 | 21 | 21 | 22 | 19 | 18 |  |
| Nature of Back or Neck Pain |  |  |  |  |  |  |  |
| CC Acute or New Onset | 33 | 35 | 30 | 34 | 28 | 27 | <.01 |
| CC Chronic | 16 | 15 | 20 | 18 | 21 | 17 |  |
| CC Pre/Post Op | 3.7 | 0.61 | 1.0 | 1.1 | 0.54 | 0.97 |  |
| CC Preventative Visit | 0.57 | 0.32 | 0.94 | 1.3 | 0.96 | 1.1 |  |
| Primary Diagnosis Only | 15 | 14 | 16 | 14 | 17 | 17 |  |
| Non-primary Diagnosis and Complaint | 31 | 36 | 32 | 31 | 33 | 37 |  |

a P-values were obtained using X2 tests with the exception of age, which was obtained using bivariable linear regression.

b Hispanic origin may include patients of any race. Other race/ethnicity includes persons of Asian, Native Hawaiian, Pacific Islander, American Indian, or multiple races.

c Physician specialty was only available in NAMCS, the number of visits or denominator for this variable therefore was n=1,604 in 1999-2000, n=1,824 in 2001-2002, n=1,712 in 2003-2004, n=1,888 in 2005-2006, n=2,063 in 2007-2008, and n=2,228 in 2009-2010.

Abbreviations: CC, chief complaint.

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| **Table A6.** Unadjusted Proportions of Comorbid Conditions over Time  |
| **Year (sample n)** | **2005-2006 (n=4,090)** | **2007-2008****(n=4,562)** | **2009-2010****(n=4,078)** | **P-value** |
| Arthritis | 29 | 26 | 29 | .30 |
| Asthma | 3.6 | 5.3 | 6.5 | <.01 |
| Cancer | 2.3 | 3.1 | 2.7 | .47 |
| Cerebrovascular Disease | 1.0 | 1.8 | 1.3 | .27 |
| Congestive Heart Failure | 1.2 | 1.6 | 1.6 | .66 |
| Chronic Renal Failure | 1.1 | 0.56 | 0.84 | .35 |
| COPD | 3.3 | 3.2 | 4.0 | .62 |
| Depression | 11 | 13 | 14 | .20 |
| Diabetes | 9.1 | 8.8 | 11 | .10 |
| Hyperlipidemia | 14 | 13 | 18 | .08 |
| Hypertension | 26 | 27 | 31 | .08 |
| Ischemic Heart Disease | 3.2 | 2.6 | 3.3 | .60 |
| Obesity | 10 | 9.5 | 8.6 | .50 |
| Osteoporosis | 3.5 | 3.7 | 3.9 | .82 |

Abbreviations: COPD, Chronic Obstructive Pulmonary Disease.

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| **Table A7.** Adjusted\* Odds Ratios for Factors Associated with Ordering CT/MRI, Referrals to Physicians, and Narcotic Prescriptions (Significant Factors in Bold) |
| **Predictor Variables** | **Ordering a CT/MRI****aOR [95% CI]** | **Referral to Physician****aOR [95% CI]** | **Narcotic Prescription****aOR [95% CI]** |
| Age (decades) | 0.97 [0.92, 1.03] | 0.98 [0.93, 1.03] | **0.88 [0.84, 0.92]** |
| Sex |  |  |  |
| Male | 1.00 [1.00, 1.00] | 1.00 [1.00, 1.00] | 1.00 [1.00, 1.00] |
| Female  | 0.90 [0.75, 1.07] | 1.07 [0.91, 1.26] | **0.86 [0.77, 0.96]** |
| Race |  |  |  |
| White | 1.00 [1.00, 1.00] | 1.00 [1.00, 1.00] | 1.00 [1.00, 1.00] |
| Black | 1.06 [0.82, 1.37] | 0.97 [0.78, 1.21] | **0.77 [0.65, 0.92]** |
| Hispanic | 0.79 [0.46, 1.35] | 0.93 [0.56, 1.54] | **0.60 [0.39, 0.95]** |
| Other | 1.03 [0.77, 1.39] | 0.98 [0.72, 1.33] | **0.51 [0.40, 0.65]** |
| Insurance Status |  |  |  |
| Private  | 1.00 [1.00, 1.00] | 1.00 [1.00, 1.00] | 1.00 [1.00, 1.00] |
| Medicare | 1.07 [0.88, 1.31] | 1.13 [0.80, 1.61] | **1.23 [1.01, 1.50]** |
| Medicaid | **0.62 [0.50, 0.88]** | 1.08 [0.84, 1.39] | **1.51 [1.22, 1.87]** |
| Workers' Comp | 0.94 [0.66, 1.33] | 0.81 [0.59, 1.11] | 1.02 [0.81, 1.30] |
| Uninsured | 0.78 [0.58, 1.06] | **0.74 [0.57, 0.97]** | **1.46 [1.21, 1.76]** |
| Identified PCP | 0.54 [0.43, 0.67] | 1.12 [0.91, 1.36] | **1.40 [1.22, 1.61]** |
| Metro Area | 1.17 [0.90, 1.53] | 1.04 [0.82, 1.32] | 0.91 [0.72, 1.15] |
| Region |  |  |  |
| Northeast | 1.00 [1.00, 1.00] | 1.00 [1.00, 1.00] | 1.00 [1.00, 1.00] |
| Midwest | 0.99 [0.77, 1.28] | 0.83 [0.62, 1.11] | 1.17 [0.88, 1.57] |
| South | 1.05 [0.80, 1.39] | 1.02 [0.76, 1.38] | **1.56 [1.21, 2.02]** |
| West | 0.84 [0.64, 1.10] | 1.02 [0.73, 1.41] | **1.57 [1.22, 2.03]** |
| Nature of Back or Neck Pain |  |  |  |
| Chief Complaint Acute or New Onset | 1.00 [1.00, 1.00] | 1.00 [1.00, 1.00] | 1.00 [1.00, 1.00] |
| Chief Complaint Chronic | **0.68 [0.52, 0.89]** | **0.69 [0.53, 0.90]** | **1.45 [1.20, 1.75]** |
| Chief Complaint Pre/Post Op | 0.99 [0.45, 2.15] | 1.05 [0.44, 2.48] | 1.12 [0.62, 2.03] |
| Chief Complaint Preventative Visit | 1.19 [0.52, 2.72] | 0.48 [0.20, 1.17] | **0.30 [0.13, 0.66]** |
| Primary Diagnosis Only | 0.95 [0.72, 1.25] | 1.22 [0.89, 1.41] | 1.04 [0.88, 1.23] |
| Non-primary Diagnosis and Complaint | 1.13 [0.91, 1.40] | 1.22 [0.93, 1.60] | 0.93 [0.80, 1.08] |
| Decade | **1.65 [1.24, 2.19]** | **1.73 [1.29, 2.32]** | **2.08 [1.65, 2.62]** |

**\*** In this table, our models adjusted for age, sex, race/ethnicity, region, insurance type, symptom duration/context, whether the provider was the PCP, and whether the visit was located in a metropolitan area.

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| **Table A8.** Quality of Evidence Behind Three Broad Clinical Guidelines for the Management of Routine Neck and Back Pain |
|  |  | **ACP/APS Practice Guidelines**2 |  | **Institute for Clinical Systems Improvement**5 |   | **European Guidelines**3**,**4 |
|  |  | **Acute (<4 wks)** |   | **Subacute/** |  | **Acute** **(<6 wks)** |   | **Subacute** **(7-12 wks)**  |   | **Acute (<6 wks)**  |   | **Subacute (6-12 wks)/Chronic (>12 wks)** |
| **Chronic (>4 wks)** |
|  | **Quality**  | **Grade**a |  | **Quality** | **Grade** |  | **Quality** | **Grade** | **Quality** | **Grade** |  | **Qualitye** | **Recommend** |  | **Quality**  |  **Recommend**  |
| **Medications** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Narcotics  |  | Fair | Bb |  | Fair | Bb |  | Poor | B |  | Poor | B |  | Fair | No |  | Good  | Yesb |
| Tramadol |  | Poor | B |  | Fair | B |  | - | - |  | - | - |  | - |  |  | Good | Yes |
| Neuropathic |  | - | B |  | Poorc | B/C/Id |  | - | - |  | - | - |  | - |  |  | Good | Noc |
| Benzo |  | Fair | B |  | Fair | B |  | - | - |  | - | - |  | Poor | Yes |  | Good | Yesb |
| Relaxant |  | Good | B |  | Poor | I |  | Fair | B |  | Fair | B |  | Good | Yes |  | Poor | Yesb |
| NSAIDs |  | Good | B |  | Good | B |  | Fair | B |  | Fair | B |  | Good | Yes |  | Good | Yes |
| APAP |  | Good | B |  | Good | B |  | - | - |  | - | - |  | Good | Yes |  | - | - |
| **Referrals** |  |  |  |  |  |  |  | - | - |  | - | - |  |  |  |  |  |  |
| PT |  | Good | D |  | Good | B |  | Fair | B |  | Fair | B |  | Good | No  |  | Good | Yes |
| Physician |  | - | - |  | - | - |  | - | - |  | - | - |  | Good | No |  | Good | Nof |
| **Imaging** |  |  |  |  |  |  |  | - | - |  | - | - |  |  |  |  |  |  |
| X-Ray |  | Good | D |  | Good | D |  | Fair | D |  | Fair | D |  | Good |  No  |  | Fair | No |
| CT/MRI |   | Good | D |   | Good | D |   | Fair | D |   | Fair | D |   | Good | No |   | Fair | No |
| a ACP, ACR, and Institute for Clinical Improvement use GRADE methodology: A = strong recommendation for, B = consider offering to eligible patients, C = No recommendation for or against, D = recommend against, I = Insufficient evidence. Of note, although the ICSI Guidelines existed in 2001 and 2004, only the 2012 guidelines are available for public use. |
| b Yes but use only after first line treatments failed and use with caution. |
| c Exception: TCAs actually have good evidence for improving chronic back pain. |
| d TCAs: B/C; gabapentin: C; topimirate: I.e The European Guidelines use the A, B, C, D system in rating strength of evidence. In order to maintain consistency we renamed A = Good, which means multiple well-designed randomized controlled trials (RTCs), B = Fair, or multiple low quality RTCs, C = Poor, or one RTC, D = no evidence (no RTCs). f Referral to surgery is only recommended if all non-invasive options have been exhausted for at least 2 years. Abbreviations: ACP: American College of Physicians; APS: American Pain Society; PT: Physical Therapy; wks: weeks; A dash (-) indicates a lack of current recommendations.  |

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| **Table A9.** Quality of Evidence Behind Three Specific Guideline Recommendations for the Management of Routine Neck and Back Pain |
|  |  | **American College of Radiology**6 |  | **Philadelphia Rehabilitation Panel**7 |  | **ACP/APS Medication Guidelines**8 |
|  |  | **Acute (<6 wks)** |  | **Subacute/** |  | **Acute (<4 wks)**  |  | **Subacute (4-12 wks)/Chronic (>12 wks)** |  | **Acute (<4 wks)** |  | **Subacute/Chronic** **(>4 wks)** |
| **Chronic (>6 wks)** |
|  | **Quality** | **Ratinga** |  | **Quality** | **Rating** |  | **Quality** | **Gradeb** | **Quality** | **Grade** |  | **Quality** | **Grade** |  | **Quality** | **Grade** |
| **Medications** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Narcotics  |  | - | - |  | - | - |  | - | - |  | - | - |  | Fair |  Bc |  | Fair | Bc |
| Tramadol |  | - | - |  | - | - |  | - | - |  | - | - |  | Poor | B |  | Fair | B |
| Neuropathic |  | - | - |  | - | - |  | - | - |  | - | - |  | - | B |  | Poord | B/C/Ie |
| Benzo |  | - | - |  | - | - |  | - | - |  | - | - |  | Fair | B |  | Fair | B |
| Relaxant |  | - | - |  | - | - |  | - | - |  | - | - |  | Good | B |  | Poor | I |
| NSAIDs |  | - | - |  | - | - |  | - | - |  | - | - |  | Good | B |  | Good | B |
| APAP |  | - | - |  | - | - |  | - | - |  | - | - |  | Good | B |  | Good | B |
| **Referrals** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PT |  | - | - |  | - | - |  | Good | D |  | Good | A |  | - | - |  | - | - |
| Physician |  | - | - |  | - | - |  | - | - |  | - | - |  | - | - |  | - | - |
| **Imaging** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| X-Ray |  | - | 2 |  | - | 2 |  | - | - |  | - | - |  | - | - |  | - | - |
| CT/MRI |   | - | 2 |  | - | 2 |  | - | - |  | - | - |  | - | - |  | - | - |
| a The American College of Radiology uses a 1-9 rating scale, where 1 = least appropriate, and 9 = most appropriate. They do not assess strength of evidence in this guideline.  |
| b The Philadelphia Rehabilitation Panel also uses the GRADE methodology: A = strong recommendation for, B = consider offering to eligible patients, C = No recommendation for or against, D = recommend against, I = Insufficient evidence. |
| c Yes but use only after first line treatments failed and use with caution.d Exception: TCAs actually have good evidence for improving chronic back pain. |
| e TCAs: B/C; gabapentin: C; topimirate: I. Abbreviations: ACP: American College of Physicians; APS: American Pain Society; PT: Physical Therapy. A dash (-) indicates a lack of current recommendations.  |

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| **Table A10.** Unadjusted Utilization Over Time (% of visits) by Practice Setting  |
| **Year (NAMCS sample n)****[NHAMCS sample n]** | **1999-2000 (n=1,604)****[n=1,746** | **2001-2002 (n=1,824)****[n=2,058]** | **2003-2004 (n=1,712)****[n=2,224]** | **2005-2006 (n=1,888)****[n=2,202]** | **2007-2008 (n=2,063)****[n=2,499]** | **2009-2010 (n=2,228)****[n=1,850]** | **P value** |
| **Medications** |  |  |  |  |  |  |  |
| Narcotics  |  |  |  |  |  |  |  |
| NAMCS | 19 | 20 | 23 | 26 | 34 | 29 | <.001  |
| NHAMCS | 18 | 23 | 27 | 34 | 33 | 32 |  <.001 |
| Tramadol |   |   |   |   |   |   |   |
| NAMCS | 3.0 | 2.4 | 1.6 | 2.5 | 4.2 | 4.7 |  .004  |
| NHAMCS | 3.1 | 4.2 | 2.6 | 4.7 | 6.0 | 7.0 |  .001  |
| Neuropathic |   |   |   |   |   |   |   |
| NAMCS | 3.3 | 3.5 | 4.8 | 4.8 | 11 | 7.9 | <.001  |
| NHAMCS | 3.9 | 5.8 | 6.1 | 9.0 | 9.9 | 8.5 | <.001  |
| Benzo/Relaxant |   |   |   |   |   |   |   |
| NAMCS | 19 | 20 | 23 | 21 | 26 | 24 | .022  |
| NHAMCS | 22 | 28 | 29 | 29 | 26 | 26 |  .69 |
| NSAIDs/APAP  |   |   |   |   |   |   |   |
| NAMCS | 37 | 30 | 32 | 29 | 27 | 24 | <.001  |
| NHAMCS | 40 | 40 | 40 | 35 | 30 | 30 |  .002 |
| **Referrals** |   |   |   |   |   |   |   |
| Physical Therapy |  |  |  |  |  |  |  |
| NAMCS | 21 | 15 | 18 | 15 | 14 | 19 |  .65  |
| NHAMCS | 14 | 7.7 | 9.7 | 11 | 12 | 14 | .59 |
| Other Physician |   |   |   |   |   |   |   |
| NAMCS | 5.9 | 13 | 11 | 11 | 15 | 14 | .001  |
| NHAMCS | 16 | 15 | 19 | 20 | 19 | 20 | .14  |
| **Imaging** |   |   |   |   |   |   |   |
| X-Ray |  |  |  |  |  |  |  |
| NAMCS | 17 | 14 | 13 | 15 | 16 | 17 | .66 |
| NHAMCS | 17 | 17 | 16 | 17 | 15 | 21 |  .38  |
| CT/MRI |   |   |   |   |   |   |   |
| NAMCS | 7.3 | 8.3 | 7.1 | 11 | 11 | 11 |  .001  |
| NHAMCS | 5.7 | 7.3 | 9.8 | 11 | 13 | 10 |  .02 |
| Abbreviations: NAMCS: National Ambulatory Medical Care Survey; NHAMCS: National Hospital Ambulatory Medical Care Survey.  |

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