BURDEN OF ILLNESS
Overview
Impact of Chronic Conditions on Health-Related Quality of Life

Note: a larger negative score indicates a greater impact on health-related quality of life

CHD = coronary heart disease; COPD = chronic obstructive pulmonary disease; CPA = chronic polyarthritis


Chronic joint pain conditions have an important impact on health-related quality of life
Physical Burden
Ankylosing Spondylitis Negatively Impacts Quality of Life

- Most common concerns:
  - Stiffness
  - Pain
  - Fatigue
  - Poor sleep
  - Appearance
  - Worry about the future
  - Medication side effects

- Ankylosing spondylitis patients have:
  - Higher well-being and lower direct cost of illness than patients with fibromyalgia or chronic low back pain
  - Higher mortality rate than the general population

Rheumatoid Arthritis Negatively Impacts Daily Functioning

• Rheumatoid arthritis causes a functional burden by limiting ability to perform daily activities:\(^1\)
  – Self-care (e.g., dressing, feeding, bathing, grooming and toileting)
  – Vocational (e.g., work, school and homemaking)
  – Avocational (e.g., exercise, recreation and leisure)

• Long-term studies have found that 50% of patients with rheumatoid arthritis have had to stop working 10 years after diagnosis\(^2\)

Hand Rheumatoid Arthritis Can Have Severe Impact

Osteoarthritis Negatively Impacts Daily Functioning

- Osteoarthritis causes a functional burden by limiting ability to perform daily activities, such as dressing, feeding, bathing, grooming and toileting\(^1\)
- 80% of osteoarthritis patients report physical limitations due to disease\(^2\)

Osteoarthritis results in functional burden to the patient and to caregivers

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Osteoarthritis Reduces Quality of Life

Workers with osteoarthritis pain have lower quality of life scores

*Range of 0–100, higher scores indicate better health, adjusted for covariates and normed to the US population (mean = 50, SD = 10)

**p <0.0001 vs. the comparator cohort.

SD = standard deviation; SF-12v2 = Short Form 12 version 2; US = United States

Osteoarthritis Reduces Quality of Life

Workers with osteoarthritis pain have lower quality of life scores.

Health Utility Score on the SF-6D†

†Range of 0 = death to 1 = perfect health; ‡p <0.0001 vs. the comparator cohort
SF-6D = Short Form 6 Dimensions
Economic Burden
Health Care Costs of Ankylosing Spondylitis Are Significant*

- 241 patients enrolled in the *Longitudinal Study of Outcomes in Ankylosing Spondylitis*
- Indirect costs dominated the total costs associated with ankylosing spondylitis

<table>
<thead>
<tr>
<th>Annual cost/patient</th>
<th>Amount (1999 USD)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>Range</td>
<td>% of total cost</td>
</tr>
<tr>
<td>Direct</td>
<td>1775</td>
<td>1113</td>
<td>0–36,267</td>
<td>26.4</td>
</tr>
<tr>
<td>Indirect</td>
<td>4945</td>
<td>0</td>
<td>0–45,800</td>
<td>73.6</td>
</tr>
<tr>
<td>Total</td>
<td>6720</td>
<td>1495</td>
<td>0–80,017</td>
<td>100</td>
</tr>
</tbody>
</table>

*United States study
US = United States; USD = United States Dollars
Economic Burden of Ankylosing Spondylitis

• 234 individuals* with ankylosing spondylitis (median duration = 21.4 years)
  – 84% still working after a 30-year history of the disease
    • 77% still working after a 40-year history
  – 13.2% reported work disability
  – 57 subjects (24.3%) had received work disability payments
    • 46% of these individuals received payments for ≤1 year

*United States (US) study
Economic Burden of Rheumatoid Arthritis

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount (2000 USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With rheumatoid arthritis</td>
</tr>
<tr>
<td>Direct</td>
<td>5763</td>
</tr>
<tr>
<td>Indirect</td>
<td>2785</td>
</tr>
<tr>
<td>Lifetime†</td>
<td>61,000–122,000*</td>
</tr>
</tbody>
</table>

Individuals with rheumatoid arthritis are estimated to be 6 times more likely than people without rheumatoid arthritis to incur medical charges.

*USD in 1995 † 25 years following a diagnosis of rheumatoid arthritis; lifetime costs were higher among younger people with rheumatoid arthritis
N/A = not available; USD = United States Dollars
Economic Burden of Rheumatoid Arthritis: Societal Costs

USD = United States Dollars

Total costs are approximately $14,900 per patient per year. Rheumatoid arthritis is a costly, chronic disease.

<table>
<thead>
<tr>
<th>Annual cost</th>
<th>Amount (billions) (2005 USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>8.4</td>
</tr>
<tr>
<td>Indirect</td>
<td>10.9</td>
</tr>
</tbody>
</table>
Osteoarthritis Increases Health Care Utilization

Workers with osteoarthritis pain have higher health care utilization

‡p < 0.0001 vs. the comparator cohort
Osteoarthritis Increases Direct Health Care Costs

Workers with osteoarthritis pain have increased health care costs.

$p < 0.0001$ vs. controls
Osteoarthritis Increases Total Health Care Costs†

Workers with osteoarthritis pain have increased health care costs.

* $15,047* vs. controls

† Including estimated indirect costs plus direct medical costs of provider visits

### Economic Burden of Osteoarthritis*

*Data from Medical Expenditure Panel Survey (1996–2005); costs were converted to annual 2007 United States Dollars (USD)

#### Annual cost per patient (n=128,493)*

<table>
<thead>
<tr>
<th></th>
<th>Amount (2007 USD)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Women</td>
<td>Men</td>
<td></td>
</tr>
<tr>
<td>Out-of-pocket</td>
<td>1379</td>
<td>694</td>
<td></td>
</tr>
<tr>
<td>Insurer</td>
<td>4833</td>
<td>4036</td>
<td></td>
</tr>
</tbody>
</table>

• Costs associated with osteoarthritis are high
• Osteoarthritis costs are disproportionately higher for women
• Out-of-pocket expenses are substantial
Economic Burden of Osteoarthritis

- Administrative claims for about 5 million privately insured patients (aged 18–64 years) with ICD-9-CM codes for osteoarthritis (1998–2004)
- Mean annual direct and indirect per-patient costs* calculated from employer’s perspective

<table>
<thead>
<tr>
<th>Annual cost per patient</th>
<th>Amount (2005 USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct medical</td>
<td>8601</td>
</tr>
<tr>
<td>Prescription pain medications</td>
<td>445</td>
</tr>
<tr>
<td>Indirect medical</td>
<td>4603</td>
</tr>
</tbody>
</table>

*Mean costs were calculated from January 2003 to December 2004 and converted to annual 2005 dollars
ICD-9-CM = International Classification of Diseases, 9th Revision, Clinical Modification; USD = United States Dollars

Osteoarthritis is a costly, chronic disease
Comorbidities
# Chronic Joint Pain Conditions Have Sleep and Mental Health Comorbidities

<table>
<thead>
<tr>
<th>Pain Cohorts</th>
<th>&gt;1 sleep comorbidity (%)</th>
<th>&gt;1 mental health comorbidity (%)</th>
<th>Mental health condition Mean (SD)</th>
<th>Depression (%)</th>
<th>Other psych disorders (%)</th>
<th>Anxiety (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MDD</td>
<td>Other depressive symptoms</td>
<td>Total</td>
</tr>
<tr>
<td>OA</td>
<td>8.0</td>
<td>15.2</td>
<td>1.4 (0.7)</td>
<td>3.5</td>
<td>3.4</td>
<td>6.2</td>
</tr>
<tr>
<td>RA</td>
<td>5.7</td>
<td>11.7</td>
<td>1.3 (0.7)</td>
<td>3.2</td>
<td>2.8</td>
<td>5.5</td>
</tr>
<tr>
<td>AS</td>
<td>7.4</td>
<td>17.3</td>
<td>1.4 (0.7)</td>
<td>4.4</td>
<td>4.1</td>
<td>4.7</td>
</tr>
<tr>
<td>PsA</td>
<td>7.6</td>
<td>13.3</td>
<td>1.3 (0.6)</td>
<td>3.5</td>
<td>3.2</td>
<td>6.1</td>
</tr>
</tbody>
</table>

AS = ankylosing spondylitis; OA = osteoarthritis; MDD = major depressive disorder; PsA = psoriatic arthritis; RA = rheumatoid arthritis; SD = standard deviation

# Chronic Joint Pain Comorbidities

<table>
<thead>
<tr>
<th>Pain cohorts</th>
<th>Comorbid pain conditions (%)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stroke</td>
<td>LR</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>6.4</td>
<td>4.8</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>5.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Ankylosing spondylitis</td>
<td>3.9</td>
<td>10.3</td>
</tr>
<tr>
<td>Psoriatic arthritis</td>
<td>2.6</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Note: infrequent comorbid conditions were omitted from the comorbid pain conditions in the table.

CR = cervical radiculopathy; HIV = human immunodeficiency virus; IC = interstitial cystitis; Fibro = fibromyalgia; LR = lumbar radiculopathy; MS = multiple sclerosis; OA = osteoarthritis; PBS = painful bladder syndrome; RA = rheumatoid arthritis

Comorbidities Associated with Arthritis

Centers for Disease Control and Prevention. *Arthritis Comorbidities.*
Comorbidities Associated with Ankylosing Spondylitis

- Most common comorbidities:
  - Hypertension
  - Peptic ulcers
  - Headaches
  - Uveitis
  - Bowel inflammation
  - Psoriasis
  - Heart disease

Comorbidities Associated with Rheumatoid Arthritis

• On average, patients with established rheumatoid arthritis have ≥2 comorbidities

• Especially problematic:
  – Cardiovascular disease
  – Interstitial lung disease
  – Osteoporosis
  – Cancer
  – Depression

Rheumatoid Arthritis Increases Cardiovascular Risk

Cardiovascular risk in rheumatoid arthritis ≈ Cardiovascular risk in type 2 diabetes

Risk score models should be adapted for patients with rheumatoid arthritis by introducing a *multiplication factor of 1.5* when ≥2 of the following conditions are met:

- Disease duration >10 years
- RF or anti-CCP positivity
- Presence of certain extra-articular manifestations

CCP = anti-cyclic citrullinated peptide ; RF = rheumatoid factor
Comorbidities Associated with Osteoarthritis

• Older patients with osteoarthritis are likely to have comorbidities
  – Visual disorders, diabetes, and heart disease occur more frequently in patients with osteoarthritis
  – Result in adverse physical function
  – Associated with adverse outcomes in joint replacement

• Recognizing and treatment comorbidities is crucial in preventing or reducing related physical decline

Burden of Illness in Chronic Joint Pain: Summary

• Chronic joint pain can severely compromise functioning, quality of life and ability to work
• It also increases health care utilization costs
• In addition, patients suffering from chronic joint pain, frequently have other comorbidities, such as sleep disturbances, mood disorders, cardiovascular disease and other chronic conditions, all of which much also be addressed