The Epidemiology of Chronic Pain

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DISCLOSURES

Dr. Stewart is the principal investigator of the following grants to the Geisinger Center for Health Research

- Johnson and Johnson funded RCT of primary care management of low back pain using an expert care system

- Glaxo funded RCT of primary care management of headache using an expert system of care

- Pfizer funded retrospective analysis of electronic health record (EHR) data on patterns of care among primary care patients with low back pain

- Merck funded retrospective analysis of EHR data on patterns of care among primary care patients with migraine

- Centecor and UCB funded retrospective analyses of EHR data to model disease progression among Rheumatoid Arthritis patients

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OVERVIEW

Focus on chronic pain epidemiology with emphasis on the common recurrent pain disorders

- AKA Chronic pain disorders with episodic manifestations

Chronic pain: Is it the product of a chronic progressive disease process?
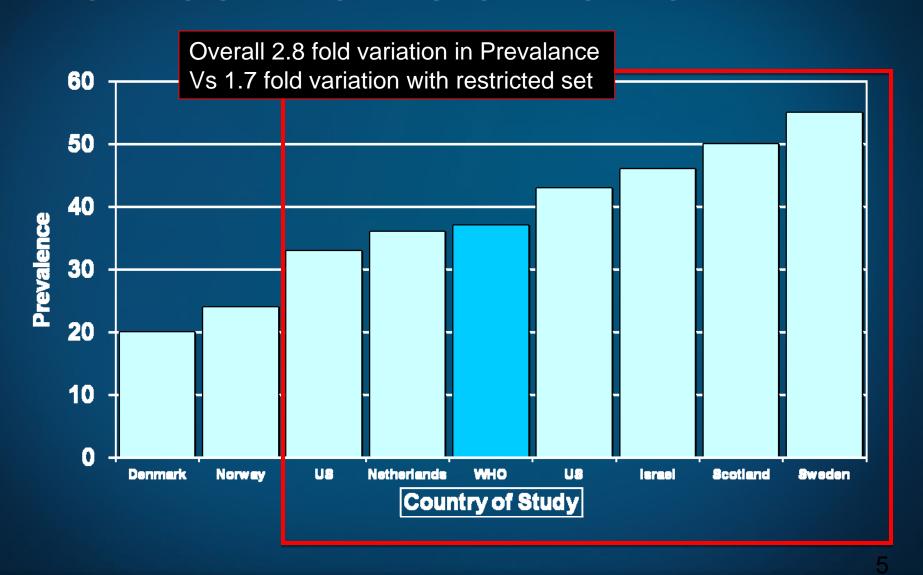
Epidemiologic terms

- Prevalence
- Incidence
- Remission

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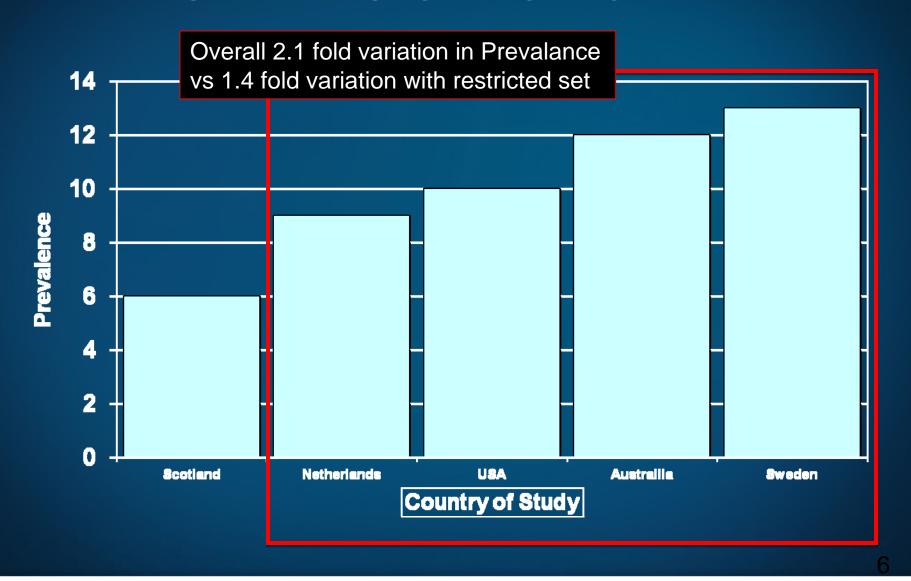# CHRONIC PAIN STATE OF KNOWLEDGE ON EPIDMEMIOLOGY

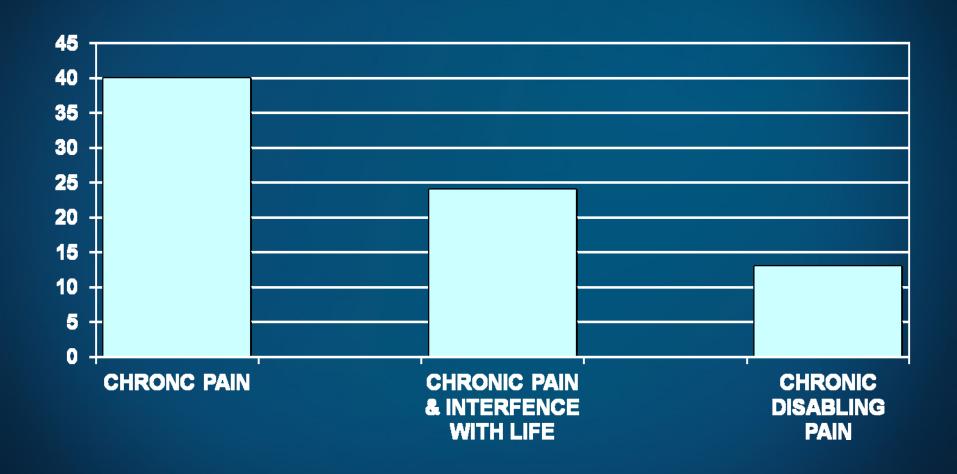|	
Source of pain	Common recurrent pain disorders are dominant but neuropathic and disease or event (e.g., injury, post-surgical) specific pain are also common.
Source of data	Most of what is known is based on self-reported status and largely focused on single conditions. Extensive condition specific work on the reliability and validity of measurement tools
Source of costs	A majority of the costs are related to impaired function and limitations to work roles. For some pain disorders, like low back pain, health care costs are substantial
Static versus dynamic view of disease	Most of the reported literature on pain disorders and chronic pain is represented by a static or cross-sectional view. Very limited longitudinal data

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HOW COMMON IS CHRONIC PAIN?

Overall 2.8 fold variation in Prevalance
Vs 1.7 fold variation with restricted set

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DISABLING CHRONIC PAIN

Overall 2.1 fold variation in Prevalance vs 1.4 fold variation with restricted set

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CHRONIC PAIN PREVALENCE

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PAIN LOCATIONS PREVALENCE, CHRONICITY, AND IMPACT

LOCATION	PRVLENCE	DURATION >3 MONTHS	OCCURS ON HALF DAYS+	HIGH IMPACT ON ACTIVITIES
HEADACHE	**40%**	66%	16%	11%
ABDOMINAL	**23%**	67%	30%	18%
BACK	**39%**	81%	45%	32%
NECK	**31%**	81%	47%	32%
SHOULDER	**29%**	79%	51%	33%
HAND/WRIST	**23%**	77%	52%	37%
HIP/KNEE	**28%**	83%	55%	40%
ANKLE/FOOT	**17%**	80%	61%	42%

Windt et al, 2008

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CHRONIC PAIN: WHO GETS IT?

FEATURE	PATTERN
GENDER	MORE COMMON IN FEMALES
AGE	VARIES BY CONDITION
EDUCATION & INCOME	INVERSELY RELATED FOR SITE SPECIFIC PAIN DISORDER AND FOR CHRONIC PAIN
RACE/ETHNICITY	VARIES BY CONDITION, BUT EVIDENCE OF LOWER PREVELANCE IN ASIAN POPULATIONS
CO-OCCURRENCE	NUMBER OF SITES OF PAIN INCREASES WITH SEVERITY OF CHRONIC PAIN DISORDER
RISK FACTORS & ASSOCIATIONS	GENDER, STRESS, DEPRESSION, ANXIETY, HIGHER BMI

VARIATION BY GENDER

Many pain conditions are more common in females. Few are more common in males
- Chronic musculo-skeletal pain
- Multi-site pain
- Migraine

The gender pattern is consistent across cultures and time

Persistence of pain and pain-related disability tend to be more common in women

Relevance to Etiology

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VARIATION BY AGE FOR COMMON PAIN DISORDERS

Age incidence & prevalence vary among common pain disorders

Impact and cost vary by age

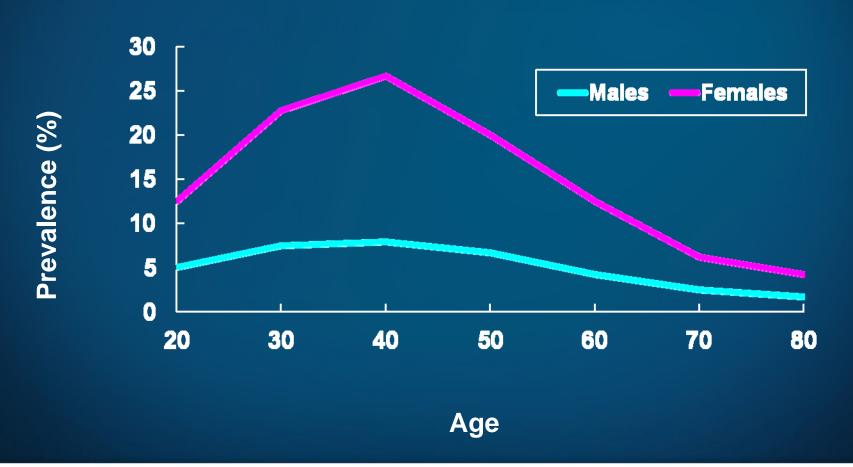Episodic versus chronic variants of common disorders also differ by age

Figure 2. Percent of female respondents with $\geq$ 2 hours of LPT per week due to different pain condition by age.
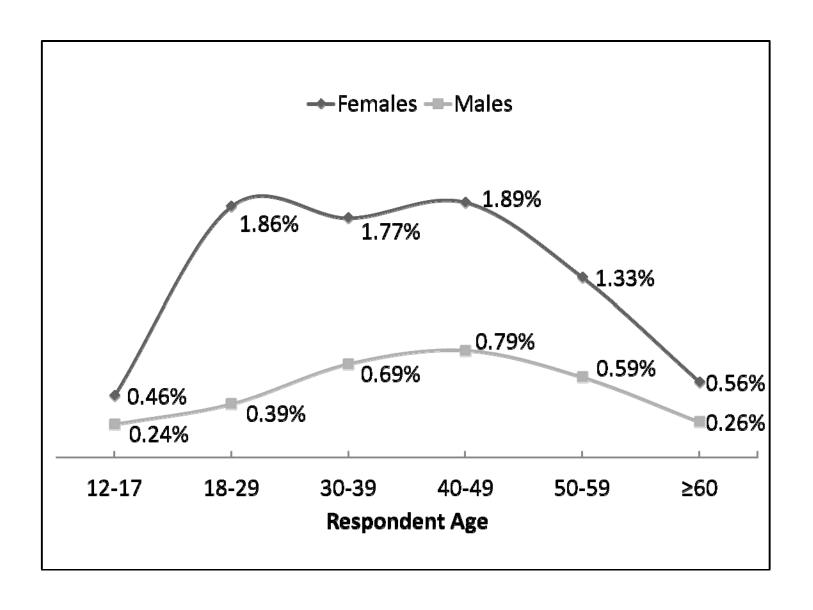
Age-Sex Specific 1-yr. Prevalence: Migraine Headache (USA, n = 20,468)

Stewart, et al., 1992

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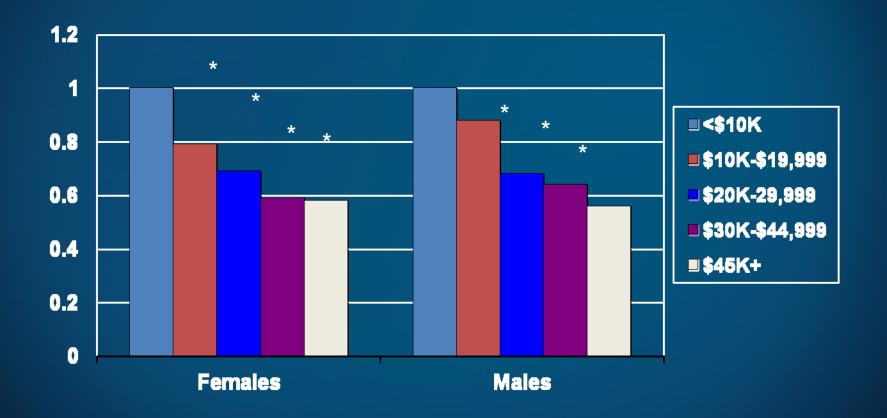REDEFINING BOUNDARIES

Prevalence of Chronic Daily Headache Among Females and Males by Age

Migraine Prevalence Ratios by Household Income[1] - US Population (n = 20,468; ages 12-80 years)
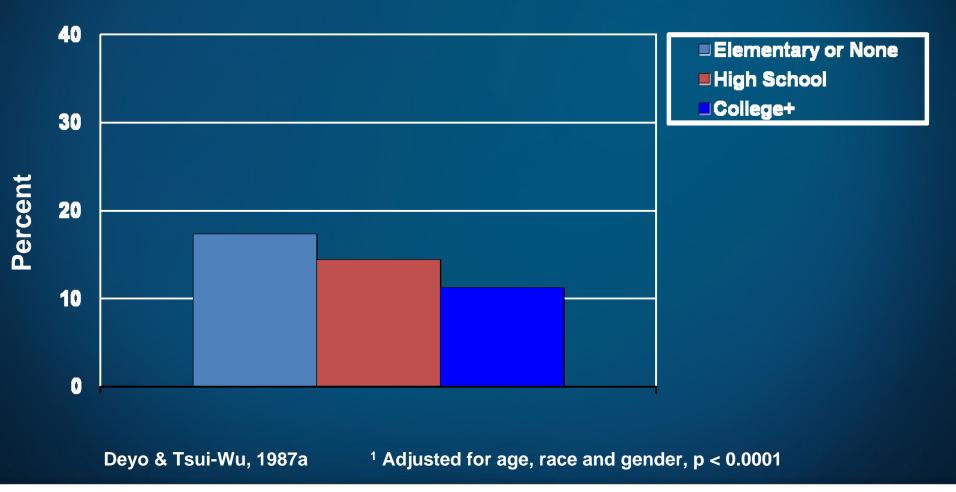

Stewart, et al., 1992   [1]Adjusted for age, race, urban vs rural, region of US
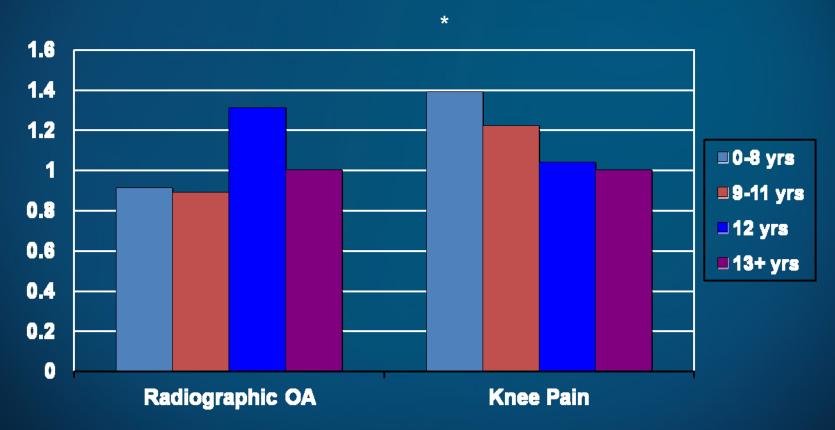
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Low Back Pain Prevalence by Education[1] - US Population (n = 10,404; ages 25 years+)

Legend:
- Elementary or None
- High School
- College+

Y-axis: Percent (0, 10, 20, 30, 40)

Deyo & Tsui-Wu, 1987a   [1] **Adjusted for age, race and gender, p < 0.0001**

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Osteoarthritis/Knee Pain Prevalence Ratios by Education[1] – US Population (Women only; n = 3605, ages 25-74 years)

Hannan et al., 1992   [1]Adjusted for age, race, smoking, BMI & injury
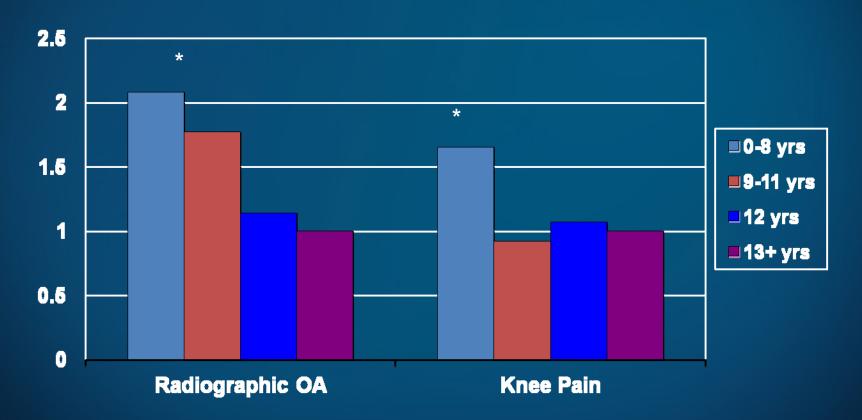
Osteoarthritis/Knee Pain Prevalence Ratios by Education[1] – US Population (Men only; n = 3099, ages 25-74 years)

Hannan et al., 1992

[1]Adjusted for age, race, smoking, BMI & injury
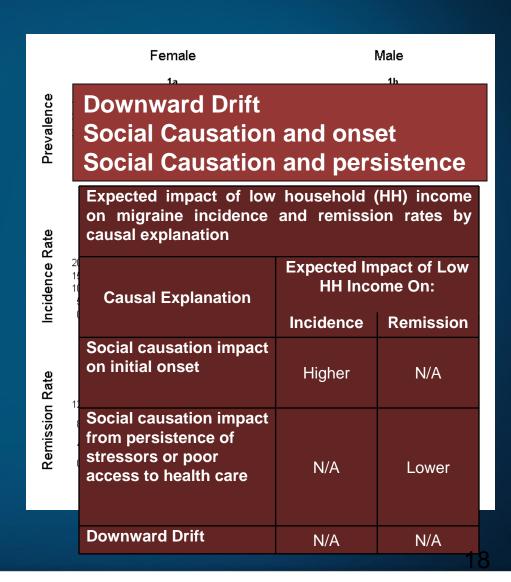
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VARIATION BY INCOME & EDUCATION

Common recurrent pain disorders are inversely related to income or education (i.e., SES or socio-economic status)

Causal framework

Causal hypothesis

Incidence and remission data support social causation as a dominant mediator of SES gradient

Downward Drift
Social Causation and onset
Social Causation and persistence

Expected impact of low household (HH) income on migraine incidence and remission rates by causal explanation

Causal Explanation	Expected Impact of Low HH Income On:	
	Incidence	Remission
Social causation impact on initial onset	Higher	N/A
Social causation impact from persistence of stressors or poor access to health care	N/A	Lower
Downward Drift	N/A	N/A

Low Income _____   Middle Income − − − −   Higher Income ···········

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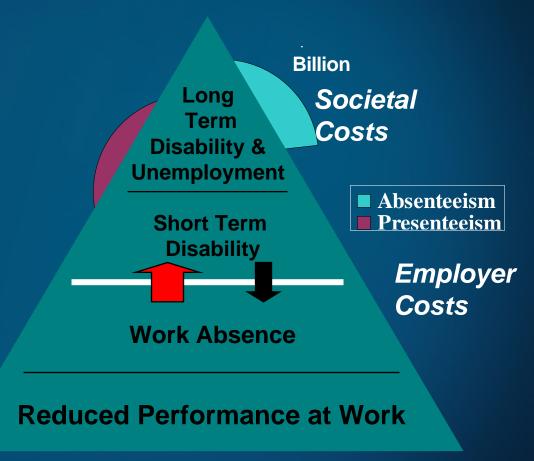
FUNCTIONAL IMPACT

The work role is one of several areas of focus in measuring impact

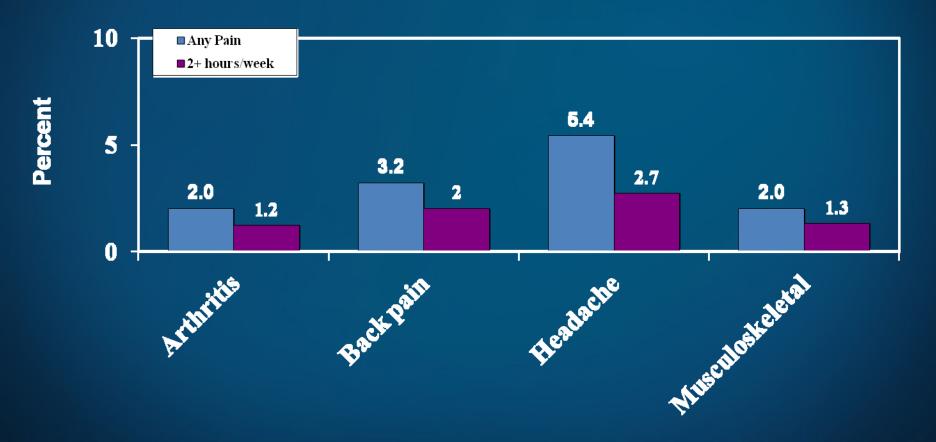Pain is the most prevalent workforce health condition

Pain is the most costly health problem in impact on lost work time

Among employed individuals, most of the pain related lost time occurs during work
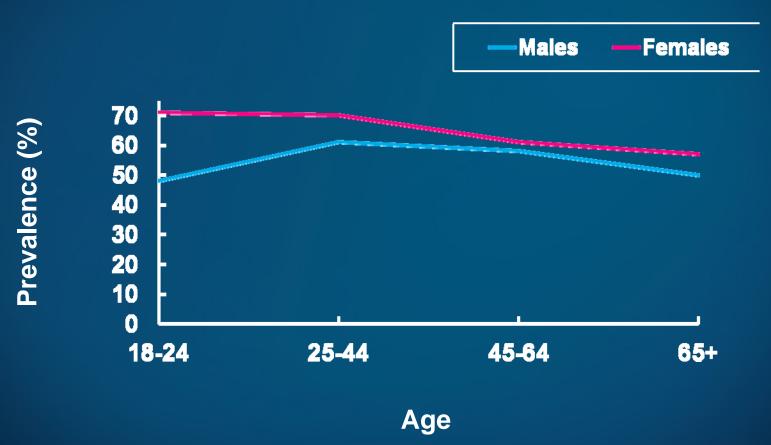
Relatively little data on pain related underemployment and unemployment costs

Source: APA 2002

Billion

Long Term Disability & Unemployment

Societal Costs

☐ **Absenteeism**
☐ **Presenteeism**

Short Term Disability

Employer Costs

Work Absence

Reduced Performance at Work

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Percent of U.S. Workers with Pain related Lost Productive Time (LPT) and 2+ hours/week LPT
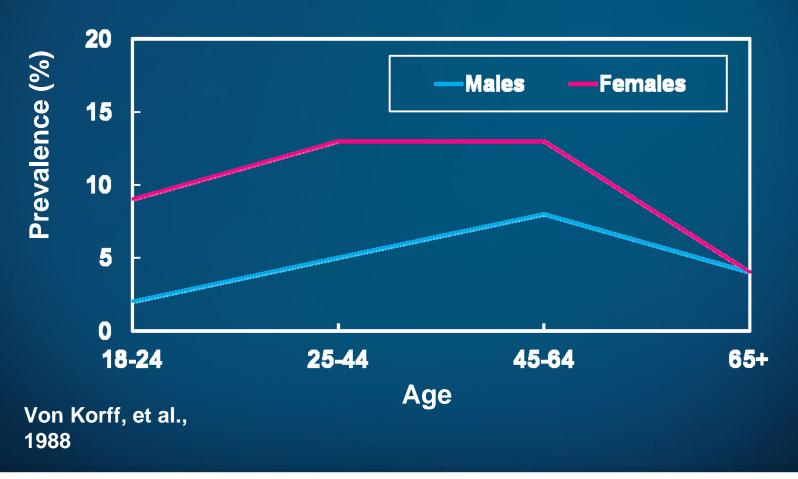
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Age-Sex Specific Prevalence of 1+
Pain Condition (of 5 investigated)
(Seattle, WA, n=1016)

Von Korff, et al., 1988

Age-Sex Specific Prevalence of 3+ Pain Conditions (of 5 investigated) (Seattle, WA, n=1016)

Von Korff, et al., 1988

INDIVIDUAL VERSUS MULTI-SITE PAIN EXPERIENCE

Most of health care is organized to diagnose and treat single pain disorders

Most people report multiple symptoms of pain

The number of painful sites increases with severity of a pain disorder

Latent class analysis evidence for defined subtypes of multi-pain disorders

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STATIC VS DYNAMIC VIEWS OF PAIN

Most studies of pain disorders are based on cross-sectional surveys
•Static view of a dynamic disease process

Numerous condition specific models to represent dynamic changes in pain status

Do chronic episodic pain disorders have features in common with chronic progressive diseases?

Is there epidemiologic support for chronic persistent pain or multi-site as end-stage disease?

No Pain

Mild Back Pain

Moderate Back Pain & Limitations

Severe Limiting Back Pain

No Headache

Episodic Headache

Frequent Episodic Headache

Chronic Headache

Chronic Persistent Headache

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