

Complex Associations Between Pain and Smoking

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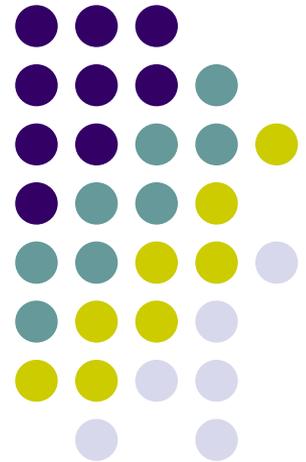
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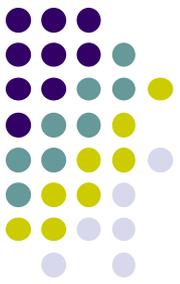
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Outline

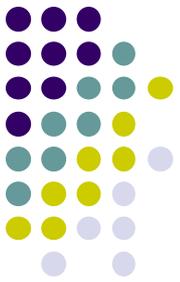
- Examine the published literature on the association of smoking status and pain
- Review a patient case
- Describe preliminary data on the impact of smoking cessation and pain levels
- Discuss clinical and research implications

Poll Question #1



Who is in the audience?

- A. Researchers
- B. Clinicians
- C. Other

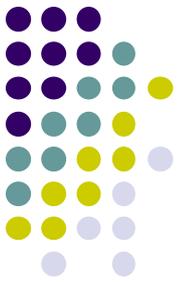


Poll Question #2

Patients that smoke cigarettes report:

- A. similar pain levels compared to patients that don't smoke
- B. Higher pain levels compared to patients that don't smoke
- C. Lower pain levels compared to patients that don't smoke

The pain/smoking association is complex



- Studies show pain prevalence and intensity are higher among current smokers
- **Yet, nicotine has analgesic properties**
- Pathophysiology is different for cigarette smoking and nicotine therapy

Shi Y et al Anesthesiology 2010; 113:977

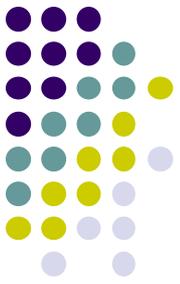
Smokers with lung cancer report higher pain levels



- We published the first study on smoking and cancer pain
- Surveyed 893 patients with lung cancer
- 76% Stage IIIB/IV and 41% mod/severe pain
- 17% persistent smokers
- Persistent smokers were **1.6 times** more likely to report moderate or severe pain compared to non-smokers and former smokers.

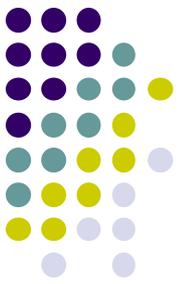
Daniel (Bastian) et al Journal of Pain 2009;10:323.

Smokers with Head & Neck cancer have higher pain



- 112 patients with head & neck cancers
- 34% current smokers
- Smokers reported higher general pain and oral pain levels even after controlling for stage of diagnosis
- Smokers reported significantly greater interference from the pain

Logan HL et al J Pain 2010;11:528

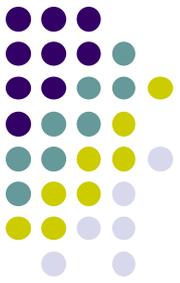


What about other cancers?

- 224 patients with breast (35%), lung (33%), bladder (6%), ovarian (6%), colon (4%) and other cancers
- 63% female
- Persistent smokers (after a cancer diagnosis) reported more severe pain and more interference from pain than non-smokers

Ditre JW et al Pain 2011;152:60

Smokers treated for Cancer pain report higher pain



- 486 patients treated for cancer pain
- 20% smokers
- Smokers had higher pain intensity and depression
- Among 192 patients on opioid therapy, smokers continued to report higher pain

Novy DM et al. J Pain 2012;13:1058

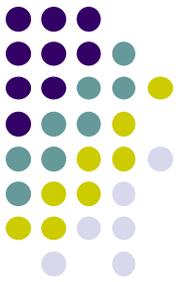
Mr. B

Age 76
stage IV lung cancer
Hospice patient
Persistent smoker with
70 pack/year history
Shortness of breath and
pain with any activity
Oxygen not allowed in
home because of fire
risk

Clinical

Recommendation:

Nicotine replacement
therapy





Mr. B, 2 weeks later

- Wearing 21mg nicotine patch and reduced cigarettes to 3 per day (only smokes outside)
- Able to shave and walk in house using oxygen
- Pain and breathing improved
- Family working on quitting, too.** They no longer smoke in the house or near patient.

Clinical Recommendation:

Add Nicotine inhaler for urges

** Social-network effect. Christakis, BMJ 2004;329:184.



Mr. B, 3 months later

- Quit smoking and uses oxygen and electric scooter to get around outside of his house
- Requires less opioid medications for pain
- His wife also quit smoking
- Hospice nurse (a smoker) was reluctant to encourage cessation but was impressed that patients' quality of life improved after he quit

Key Point: Health Care workers can be a barrier to smoking cessation for patients with cancer.



Case Highlights

- Mr. B's pain and quality of life improved
- Family members were motivated to quit
- Initially, his hospice nurse was reluctant to address smoking cessation, she said “did not seem fair”
- Important to inform the patient, family members, and clinicians that there are benefits to quitting.



Poll Question #3

- Is there a role for smoking cessation in the management of cancer pain?
- Yes
- No
- Unsure

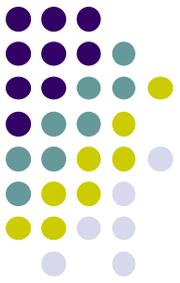
Is this complex association unique to cancer patients?



- No
- Brief review of smoking and non-cancer pain
- Like with cancer pain, studies are observational and do not determine causality.

Fishbain DA et al Pain Medicine 2012; 13:1212

Hypothesized Feedback Loop



- Does smoking increase pain? Or does pain increase urge to smoke?
- Reciprocal relationship between pain and smoking that operates as a positive feedback loop, leading to greater pain, increased smoking, and the maintenance of nicotine dependence

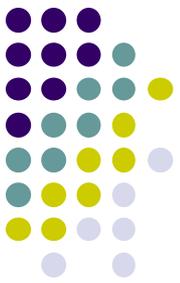
Ditre JW & Brandon TH J Abnorm Psychol 2008;117:467

Smokers have more severe back pain



- National Spine Network database (U.S.)
- 11,494 men and 13,961 women
- 16.7% smokers
- Smokers were more likely to report severe pain and to report symptoms of depression
- Smokers also reported less improvement after back surgery compared to non-smokers

Vogt MT et al Spine 2002; 27:313

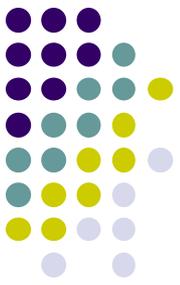


Smokers have more back pain

- Meta-analysis of 40 studies
- Current Smokers had an increased prevalence of low back pain compared to non-smokers OR=1.30 (95% CI 1.16-1.45)
- Former smokers OR=1.24 (95% CI 1.11-1.38)
- Lower rates for former smokers suggests that smoking cessation will reduce back pain

Shiri R et al. Am J Med 2010;123:87e7-87e35

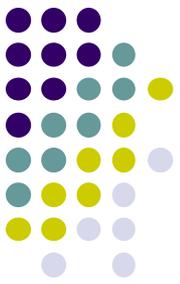
Smokers report more pain locations & more analgesic use



- 7,124 survey respondents from population database in Germany
- Ages 18-79
- Heavy smokers (>20cigs/d) 8.6% women and 17.1% men
- Heavy Smokers report more pain locations and higher pain intensity in past 7 days
- Heavy Smokers have more analgesic use

John U, et al Prev Med 2006;43:477 & John U, et al Drug Alc Dep 2006;85:49.

Smokers with fibromyalgia report greater pain intensity



- 984 patients evaluated in the Mayo Clinic Fibromyalgia Program
- 14.7% current smokers
- Smokers reported greater pain intensity and higher scores on the Fibromyalgia Impact Questionnaire

Weingarten TN et al Clin J Pain 2009;25:39

Combination of smoking and depression 2 times risk of pain



- 18,439 Health & Retirement Study
- 15% depression
- 34% troubled by pain
- Smoking increased the likelihood of incident pain only in those subjects who also reported depression

Shi Y et al Pain 2010; 151:366

Effects of Depression and Smoking on opioid use



- 1,241 in out-patient pain treatment program
- 25% current smokers
- Smokers had higher depressive symptoms and pain and greater morphine equivalent dose
- Multivariable model, smoking associated with greater opioid use

Hooten WM et al. Pain 2011; 152:223

Older smokers have more intense pain



- 1,141 patients (ages 65-103) in Sweden
- 54% women and 38% chronic pain
- 9% smokers
- Female smokers have higher pain prevalence and pain intensity
- Male smokers have higher pain intensity

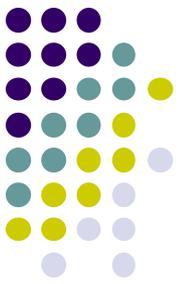
Jakobsson U et al Pain Practice 2013; in press

Smokers with chronic pain have greater pain intensity



- 230 patients in Mayo Chronic Pain Clinic
- 15% smokers
- Smokers report greater pain intensity and pain interference with functioning
- Nicotine dependence was also associated with greater pain.

Weingarten TN et al Pain Physician 2008;11:643



Veterans with Chronic Pain

- 6,377 Veterans ages 19-97 (9% female)
- 36.7% current smokers
- Smokers were 1.4 times more likely to have any abuse of prescription drugs adjusting for depression and pain
- Smokers were 1.8 times more likely to have frequent prescription drug abuse

Becker WC et al Pain Medicine 2009; 10:531

Smoking cessation in patients with chronic pain



- 112 patients in chronic pain clinic
- 50% smokers
- Smokers were encouraged to quit by their pain clinic physician and 91% reduced the number of cigarettes they smoked
- Reduction in number of cigarettes was associated with improved breathing, feeling better, and less pain.

Kaye AD et al Ochsner J 2012;12:17

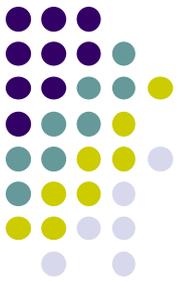
Effect of smoking cessation on pain in older adults



- 6,258 smokers in Health & Retirement Study
- 50% female and 31% pain
- 44% quit smoking between 1993 and 2006
- In this longitudinal study, no association was found for the effect of smoking cessation on pain in older adults (OR=0.87 95%CI 0.70-1.08)

Shi Y et al Nicotine & Tobacco Res 2011;13;919

Impact of smoking cessation on pain outcomes



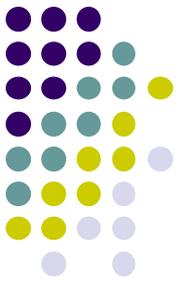
- To date, only observational studies have been published.
- Next step is to examine the effect of smoking cessation on pain in randomized clinical trials

Smoking Cessation Trial at the Durham VA in North Carolina



Funding support: VA HSR&D IIR 05-202
Bastian et al. Comparative Effectiveness
Research 2012;2:45.

Key Investigators from Durham NC



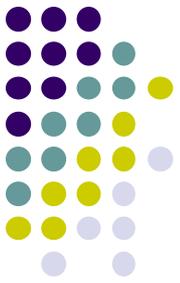
- Laura Fish, PhD
 - Jennifer Gierisch, PhD, MPH
 - Steve Grambow, PhD
 - Karen Stechuchak, MS
 - Lesley Rohrer, MPH
-
- Funding support: VA HSR&D IIR 05-202

Smoking cessation for chronically ill veterans



- Veteran's environment and social support (in particular family support) impacts their motivation and self efficacy to stop smoking.
- Higher cessation rates have been noted among smokers who report receiving greater positive support relative to negative support.

Examples of Family Support

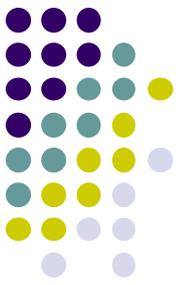


Positive Support

- Affirmation “Good Job”
- Encouragement for discussing a plan with the person’s provider
- Support for person’s efforts to try and quit

Negative Support

- Nagging or complaining about their smoking
- Calling them idiots or telling them they are disgusting
- Making ultimatums



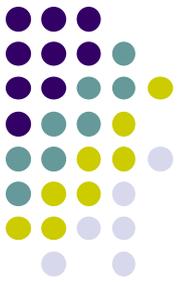
Family Matters Trial

- A telephone-based family-supported intervention that teaches how to minimize negative support and maximize positive support could improve cessation.
- A comparative effectiveness trial to test a family-supported telephone counseling intervention compared to standard telephone counseling for increasing smoking cessation among veterans with chronic illness.

Sample



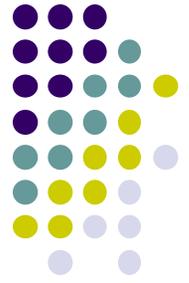
- Sample size = 471 veterans
- Diagnosed with chronic illness at Durham VA
 - Heart disease, cancer, hypertension, COPD, diabetes
- Currently smoking
- Planning to quit in the next 30 days
- Able to identify one person (relative/friend) to support them while they quit smoking.



Proactive recruitment

- Patients identified using computerized medical record.
- Mailed an introductory letter informing them of the study and encouraging them to quit.
- Patients are called to assess eligibility criteria and invited to enroll in the Family Matters study.

2 telephone-based interventions

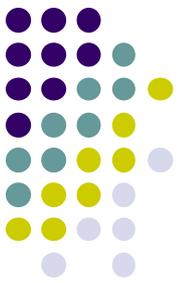


- Family support:

- Letter from MD
- Self-help materials
- Choice of NRT
- Five **family-supported** telephone counseling sessions; including an 8-page family support booklet with activities to enhance positive support and minimize negative support

- Standard counseling:

- Letter from MD
- Self-help materials
- Choice of NRT
- Five **standard** telephone counseling sessions

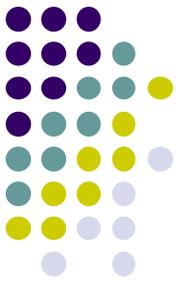


Baseline Characteristics

Variable	Family-support (n=235)	Standard (n=236)
Age, mean	59	59
Female	9%	8%
Cardiac	43%	42%
Cancer	33%	35%
Other chronic illness*	23%	23%

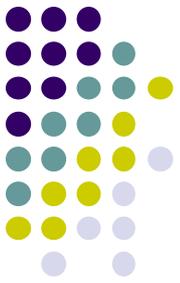
*Hypertension,
COPD, Diabetes

Smoking history



Variable	Family-support (n=235)	Standard (n=236)
Quit attempt after diagnosis	74%	75%
Self-efficacy for quitting (scale 1-7)	5.8	5.7
Heaviness of Smoking(scale 0-6)	2.8	2.8
Lives with a smoker	38%	32%

Depression and Pain



Variable	Family-support (n=235)	Standard (n=236)
Depressive Sx (Brief CES-D \geq 10)	53%	56%
Mean Pain level (Pain scale 0-10)	5.1	5.2
Poor/Fair Self-rated Health	59%	60%

Results of Comparative Effectiveness Trial



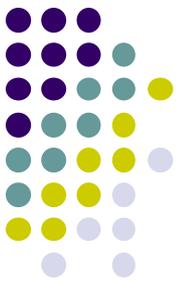
Variable	Family-support (n=235)	Standard (n=236)
Smoking cessation 5 months*	20%	22%
Smoking cessation 12 months*	22%	22%

*86% follow-up at 5 months and 81% follow-up at 12 months



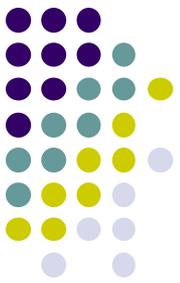
Factors associated with Pain

Variable	Pain at 5 months	Pain at 5 months
	Unadjusted	Adjusted
Arm	NS	NS
Age	-0.11	-0.05
Abstinent at 5m	-1.07	NS
Cancer	NS	NS
Baseline pain	0.68	0.60
CES_D score	0.18	NS
Rated fair/poor health	1.73	NS



Research Implications

- Need more prospective studies to examine impact of smoking cessation on pain severity
- Family Matters was 90% men and there may be gender differences (i.e., women may be more affected by this association than men)
- Potential study populations: chronic pain, back pain, fibromyalgia, and cancer



Clinical Implications

- Qualitative study on physician attitudes
- Focus group of 7 physicians (specialists)
- Physicians identified many barriers to smoking cessation in a pain treatment clinic
 - Don't have time for counseling
 - Hard to “zone in on the smoking part”
 - Patients smoke to cope with pain and they are under too much stress to try and quit

Hooten WM et al Pain Practice 2011;11:552



Clinician Advice Matters

- Compared to smokers who receive no advice from a clinician, smokers who receive such advice are 1.7–2.2 times as likely to quit smoking.
- 3-minute MD advice results in a 10% quit rate.
- Focus on the clinical benefits of quitting. If you are treating their low back pain, inform them of the potential pain improvement with quitting.

Fiore et al. *Treating Tobacco Use and Dependence. Clinical Practice Guideline.*
USDHHS, PHS, 2000

Spock

