Understanding Primary Care Physicians' Treatment of Chronic Low Back Pain

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Purpose

1. To empirically define classes of physicians according to their approach to treating uncontrolled chronic low back pain

2. To identify physician characteristics, attitudes, & beliefs and practice characteristics that predict class membership

Chronic Pain Treatment

- Prevalence of chronic non-cancer pain high and rising in VA.
  - In one study, ~60% of VA patients discharged between 10/1/01 and 11/30/07 reported pain and 26% reported moderate to severe pain. (Haskell et al, 2009)
  - Much variability in physicians' treatment decisions (Somerville, Hay et al 2008)
  - Lack of consensus on treatment despite VA and other organizations' guidelines
- VA/DoD Guidelines specify that opioids should be used when other pain therapies are inadequate

Historical Trends

- Use of opioids to treat chronic pain increased through the 1990's
  - clinical community and regulatory boards more supportive of their use (Gilson & Joranson 2001)
  - compensation systems favored brief visits for medication management (Gallagher & Rosenthal 2008)
  - aggressive marketing (Olsen, Daumit, Ford 2006)
- Use leveled off in the 2000's as concerns over tolerance, side-effects, diversion, and dependence grew
- More recently, use of opioid treatment has increased, but there remains wide variability in whether opioids are used.
- Little is known about frequency of multimodal approach to treating chronic pain

Efficacy of Opioids for Chronic Pain

- Recent meta-analysis of studies of opioid efficacy for long-term reduction in chronic non-cancer pain found
  - significant reduction in pain across studies
  - signs of opioid addiction in only .05%, and abuse in only .43% of participants.
- However, 33% of participants using oral opioids discontinued treatment due to side-effects, and 12% withdrew due to insufficient pain relief.
  (Noble et al 2008)

Efficacy of Psychological Therapies

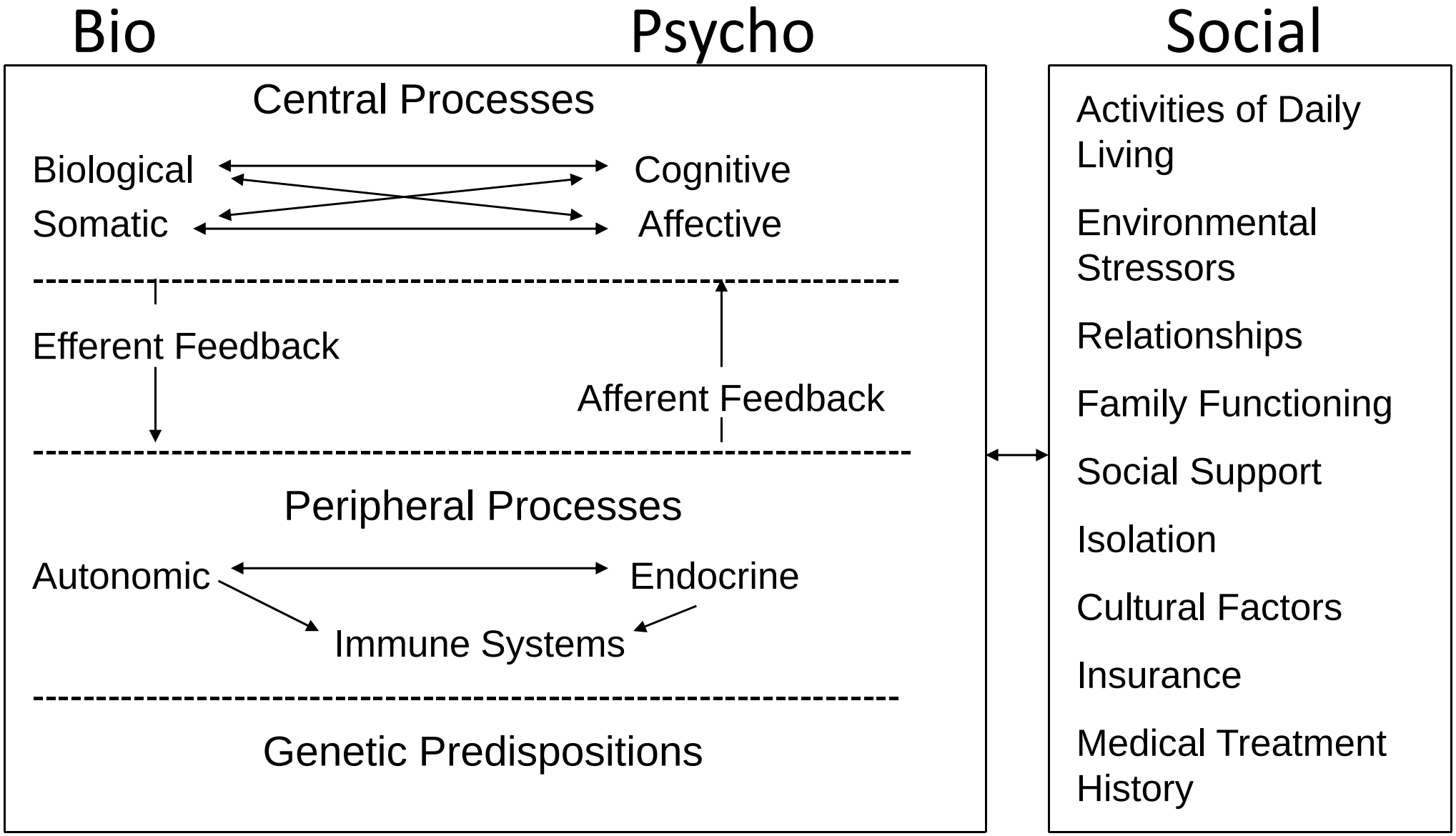
- Clinical trials provide evidence that Cognitive-Behavioral Therapy reduces pain severity. (Glombiewski et al 2009, Morley et al 1999)
- Maladaptive coping strategies like catastrophizing shown to increase pain severity, while cognitive strategies like imagery, distraction, and positive expectancy shown to reduce pain severity (Gatchel et al 2008)
- Meta-analysis of anti-depressant therapy for chronic pain shows it reduces pain severity (Salerno et al 2002)

Social Factors and Chronic Pain

- A number of social factors affect and are affected by pain.
- Expectations based on previous medical treatment may lead to postponement of care
- Frustration over lack of relief or loss of ability to work may exacerbate perceived severity of pain
- Relationships, social support, family functioning can greatly influence perceived severity of pain

Biopsychosocial Pain Model

(Gatchel, et al 2007)



Biopsychosocial model

- Pain has physiological, psychological, and social components
- Nociception refers to nerve stimulus indicating tissue damage
- Pain refers to subjective perception that is influenced by:
  - genetic predisposition,
  - past experiences,
  - coping strategies,
  - psychological status, and
  - sociocultural background

Biopsychosocial model

- **Does not imply that pain is not real**, rather that the complexity of the pain experience means that there are multiple causes of pain and areas of intervention.
- Avocates a **multimodal pain treatment** focused on emotion, cognition, functioning, behavior as well as nociceptive dysregulation.

Current Study

- The current study was designed to understand variations in pain treatment by physician, practice, and patient factors.
- Opportunity to apply latent variable technique to evaluate whether physicians are utilizing a multimodal approach to treat chronic nonmalignant pain
- Measuring characteristics of physicians that do utilize a multimodal approach may inform future physician training

Methods

Photonovella

- Between-subjects design
- Physicians randomly assigned to receive 1 of 24 patient scenarios that varied by patient race, age, facial expression, and ‘red vs. green flag’ dialogue (these factors are adjusted for in analysis)
- Patient ‘clinic note’ history identical
  - Identified patient as veteran
- Four images of patient in a clinical setting accompanied by dialogue

Clinic Note

A 45-year old male patient with complaint of severe intermittent low back pain for 6 months. The patient noted the onset of pain after lifting a heavy box 1 year ago. The pain has been increasing in intensity over the past few months.

He reports that his previous primary care physician prescribed naproxen, but this caused reflux symptoms and was subsequently discontinued. He tried physical therapy but this made the pain worse, so he stopped going. He has been taking extra strength Tylenol 2 tablets bid with no improvement in the pain.

He gives a history of drinking heavily in the military but reports that he currently only drinks 1-2 beers every other week. No history of illicit drug use.

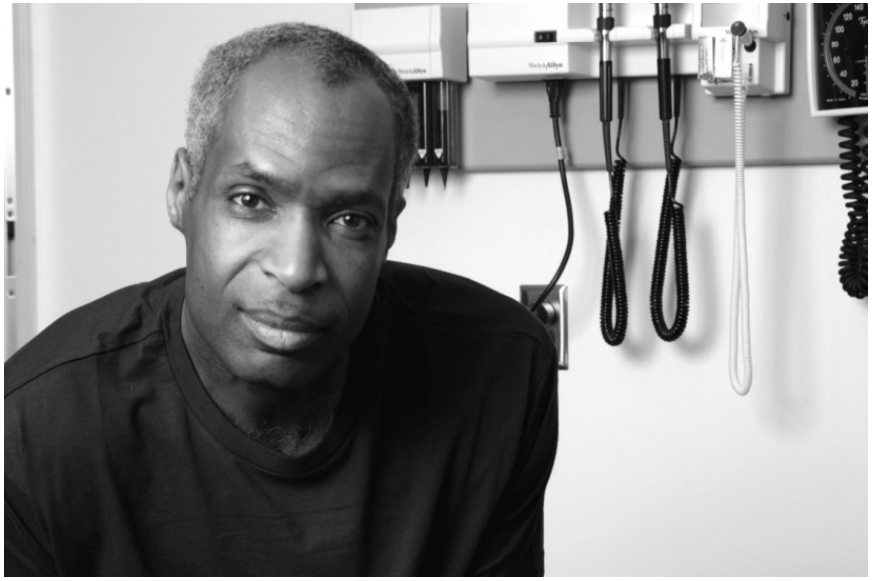
His old medical records are currently not available.

On physical exam, he appears in moderate pain when moving on and off the exam table. Spine is normally aligned. No focal tenderness over the lumbar spine but lumbar paraspinal muscles are mildly tender to palpation bilaterally. Forward flexion of the lumbar spine is limited to 60 degrees by pain. Gait is stable but slow due to pain.

Lower extremity strength is 5/5 bilaterally and deep tendon reflexes are +2 bilaterally. Straight leg raise is negative bilaterally.

Lumbar spine x-rays are normal.

Images from Questionnaire



Dialogue

1. Doctor: So, what's going on today? What brings you in?

Patient: This pain in my back again, it's pretty bad.

2. Doctor: When do you have the pain?

Patient: Well, it's pretty much with me all the time, I guess.

3. Doctor: Are you able to do your usual activities? Go to work, sleep, that sort of thing?

Patient: Well, I do my job, of course, I do what I have to do. I've had to miss a few weeks, though. It does bother me some at night when I'm trying to sleep, I've got to admit.

4. Doctor: Well, your physical exam doesn't show anything abnormal or new from last time. What have you tried for it?

Patient: Not much really, I don't like to take anything. I tried that Tylenol 3 you gave me a couple times, but that's about it. It helped right after but it didn't last long. Maybe I should try something else.

Doctor: Have you tried physical therapy?

Patient: I went to physical therapy a couple of times, but it actually made the pain worse.

Sample

- Questionnaires sent to national sample of 1000 general internal medicine doctors drawn randomly within region from the AMA Masterfile
- 953 were delivered to known addresses
- 382 (40%) were returned
  - 30% female
  - Average Age = 45; SD=12
  - 58% white; 22% Asian/PI; 7% Latino/Hispanic; 5% Black; 4% Southwest Asian/Indian; 5% Other race

Outcome Measure

Please indicate how likely you would be to take each of the following actions with this patient…

1. Discuss emotional issues and their possible contribution to pain?
2. Order further diagnostic testing?
3. Perform functional assessment?
4. Refer for physical therapy?
5. Refer for mental health evaluation?
6. Refer to a pain clinic or specialist if available?
7. Further question patient about drugs and alcohol?

Outcome Measure

Please indicate how likely you would be to take each of the following actions with this patient…

8. Instruct patient to take the Tylenol 3 more regularly and at a higher dose?
9. Change patient's treatment to a different schedule 3 opioid?
10. Treat this patient with a short-acting Schedule 2 opioid (such as Dilaudid or Percocet) on an as-needed basis?
11. Treat with a long-acting Schedule 2 opioid (such as Fentanyl Patch, Oxycontin, methadone, or sustained-release morphine) on a fixed around-the-clock basis?

Latent Class Analysis

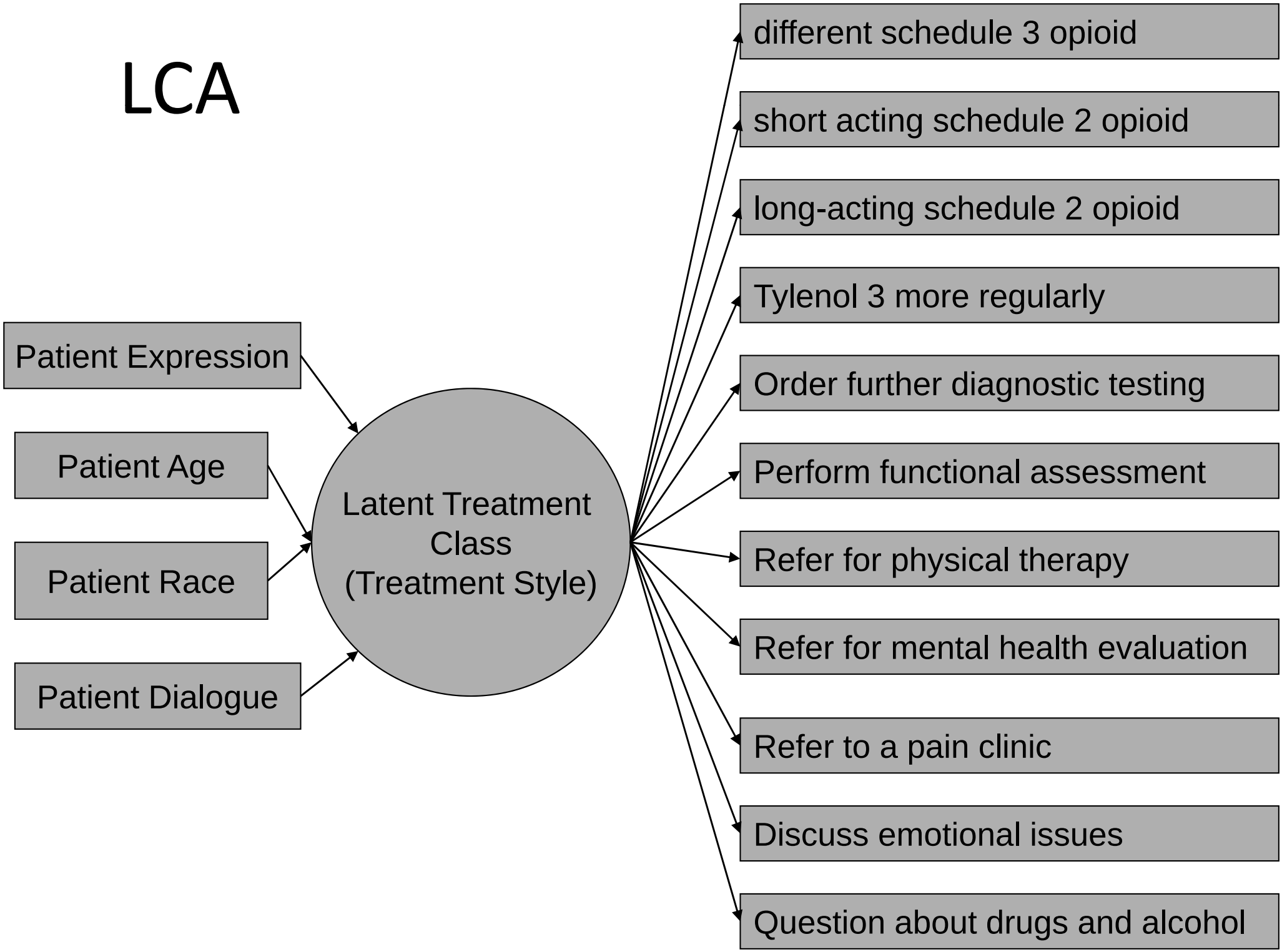
- Multivariate data reduction technique
- Indicator variables relate to a latent construct-a variable that is not directly observable
- Can be thought of as factor analysis applied to categorical indicators that results in a categorical latent variable (classification of people).

Latent Class Analysis

- Creates categories based on posterior probability of a certain response to an indicator item, given membership in a particular class.

- Conditional Independence: If we could condition on the latent class variable, the observed indicator variables would be independent
  - In other words, <u>each individual's latent class category is the underlying cause of all observed associations</u>

LCA


Patient Expression
Patient Age
Patient Race
Patient Dialogue
Latent Treatment Class (Treatment Style)
different schedule 3 opioid
short acting schedule 2 opioid
long-acting schedule 2 opioid
Tylenol 3 more regularly
Order further diagnostic testing
Perform functional assessment
Refer for physical therapy
Refer for mental health evaluation
Refer to a pain clinic
Discuss emotional issues
Question about drugs and alcohol

LCA Model Selection

- We considered a 2,3,4,5,and 6-latent class solution.
- The 3-class model had superior sample-size adjusted Bayesian Information Criterion and made sense conceptually
- Probability of endorsing each treatment option within groups presented on next slide
  - Yellow cells: within-group probability > overall sample probability,
  - Brown cells: within-group probability < overall probability,
  - White cells: within-group probability within 5% of overall sample probability

LCA Results

Conditional Probability of Treatment Use, Given Class Membership (Column)

Treatment	Overall Sample n=381	Class 1 Multimodal / Aggressive (14%) n=54	Class 2 Psychosocial / Non-opioid (48%) n=181	Class 3 Low Action (38%) n=146
1) Discuss emotional issues	57%	**79%**	**73%**	31%
2) Order further diagnostic testing	63%	**77%**	61%	61%
3) Perform functional assessment	60%	**81%**	**72%**	38%
4) Refer for physical therapy	50%	50%	**58%**	40%
5) Refer for a mental health evaluation	15%	17%	**28%**	0%
6) Refer to pain clinic/specialist	56%	**71%**	61%	44%
7) Question about drugs/alcohol	62%	**85%**	**84%**	30%
8) Tylenol 3 regularly/at higher dose	17%	**29%**	8%	21%
9) Change to different schedule 3 opioid	18%	**53%**	0%	**24%**
10) Treat w/ short-acting schedule 2 opioid	14%	**41%**	0%	19%
11) Treat with long-acting schedule 2 opioid on fixed basis	11%	**40%**	0%	10%

Latent Classes

- Multimodal / Aggressive treatment (MA) - 14%
  - Endorsed every option at the overall sample probability or greater
  - Medication and psychosocial options
  - Also question about drug/alcohol use at high rate
- Psychosocial / Non-opioid (PNO) – 48%
  - Endorsed non-opioid treatments at higher-than-average rates
  - Most likely to refer to physical therapy or mental health evaluation
  - Almost no endorsement of opioid therapies
- Low action (LA) – 38%
  - About as likely as average to utilize opioid therapies
  - Less likely to utilize psychosocial therapies

Discussion 1

- Novel approach to capturing different approaches to treating chronic pain
- Without LCA, it is somewhat more difficult for clinical vignettes to capture physicians' approach to pain treatment since one is restricted to comparing various treatments in isolation
- Latent variable methods allows data to define 3 "types" of physicians
- Multimodal / Aggressive class (MA) perhaps most consistent with treatment that follows the Biopsychosocial Model of Pain.
  - Smallest group (14%)

Moving Physicians into Multimodal Treatment Group

- Based on our interpretation that the MA group represents a pattern of aggressive multimodal treatment, stage 2 of analysis focuses on describing the characteristics of physicians in this group in comparison to physicians in the other two groups in order to better understand these physicians and identify factors that may be modifiable to encourage multimodal treatment of chronic pain.

Regression Methods

- The second stage of analysis consisted of a multivariate multinomial logistic regression model evaluating differences in physician characteristics, attitudes, beliefs and practice factors across latent treatment pattern class.

Measures – Physician Traits

- Physician demographic traits
  - Sex, race/ethnicity, age
- Jefferson Scale of Physician Empathy (9 items)
  - “I try to imagine myself in my patients’ shoes when providing care”
  - Cronbach’s alpha=.86; Item-scale correlations .47-.69
- Medical Authoritarianism Scale (5 items)
  - “Those who contribute the most to society should get better health care”
  - Cronbach’s alpha=.82; Item-scale correlations .47-.74

Measures – Physician Traits

- Revised Pain Attitudes Questionnaire Stoic-fortitude subscale (5 items)
  - “ I go on as if nothing had happened when I am in pain”
  - Cronbach’s alpha=.81; Item-scale correlations .55-.65

Measures – Pain Attitudes

- Positive attitude toward opioids (3 items)
  - "Opioids are underused in treatment of chronic nonmalignant pain"
  - Cronbach's alpha=.60
- Negative attitude toward treating pain (2 items)
  - "I do not look forward to managing patients with chronic pain problems"
  - Cronbach's alpha=.59
- "There is always a physical cause for chronic pain even if doctors cannot diagnose it."
  - Endorsed (4,5 / 5) by **13%**

Measures – Perception of the Patient

- Patient Trustworthiness

  In your opinion, how likely is it that this patient

  - 1) has pain that is psychosomatic in origin
  - 2) has substance abuse problems,
  - 3) can be trusted,
  - 4) may be exaggerating his pain,
  - 5) may be at risk for addiction,
  - 6) may be drug seeking,
  - 7) would be difficult to work with,
  - 8) is trying to take advantage of you
    - Cronbach's alpha=.88, I-S correlations .49-.78

Measures – Perception of the Patient

- Perceived Compliance

  In your opinion, how likely is it that this patient

  – 1) Is likely to follow treatment recommendations

  – 2) Is likely to follow-up for clinic visits

    - Cronbach's alpha=.75, Item correlation .60

- Patient Contributing to Pain

  In your opinion, how likely is it that this patient

  – 1) Needs to take more responsibility for pain management

  – 2)may be contributing to his pain by his own behavior

    - Cronbach's alpha=.74, item correlation .59

Measures – Concerns about Opioids

- How concerned would you be about the following issues if you prescribed opioids for this patient:
  - **Drug Use**: Tolerance, physical dependence, reducing chance other treatments will be utilized, addiction, diversion for illegal use, physician's risk of legal actions/sanctions.
    - Cronbach's alpha=.85, I-S correlations .55-.75
  - **Effectiveness**: lack of effectiveness in treating pain, lack of effectiveness in improving function
    - Cronbach's alpha=.87, item correlation .77

Measures – Resources

- I have adequate consultation/referral resources to help patients with chronic nonmalignant pain
  - 4,5 / 5: 56%
- My knowledge of pain evaluation and treatment is sufficient
  - 4,5 / 5: 37%

Measures – Practice Characteristics

- Approximately what percentage of your patients
  - Are less than 18 years old?
  - Are between 18 and 65 years old?
  - Are over 65 years old?
  - Are non-white
  - Receive Medicaid or other government assistance
  - Have chronic nonmalignant pain
- Region of US from AMA mailing address

Analysis

- Bivariate models (linear or logistic) identified factors that differed across latent class.
- Factors associated with class at $p<.20$ were entered into a multinomial logistic model predicting class (3-level outcome), and were eliminated using step-wise backward elimination.

Results of Final Model

Multimodal / Aggressive Group compared to…

	…Psychosocial/Non-opioid	…Low Action
Authoritarianism	**1.69 (1.15, 3.57)**	1.24 (.84, 1.85)
Patient is not trustworthy	.86 (.47, 1.57)	**2.59 (1.36, 4.95)**
Concern about drug use	.70 (.40, 1.23)	1.14 (.63, 2.05)
Concern about effectiveness	1.39 (.94, 2.04)	**1.57 (1.04, 2.35)**
Positive attitude toward opioids	**1.80 (1.13, 2.86)**	**1.65 (1.02, 2.68)**
Chronic pain always has a physical cause	1.84 (.91, 3.75)	**3.08 (1.46, 6.50)**
Adequate consultation/ referral resources	.86 (.43, 1.72)	**2.49 (1.21, 5.14**)
>35% of patients has Medicaid	**2.84 (1.43, 5.64)**	**2.65 (1.29, 5.43)**
<5% of patients <18	3.05 (.98, 9.53)	**4.47 (1.39, 14.41)**

Odds Ratios (95% Confidence Intervals)

Discussion

- Compared to the psychosocial/non-opioid group…
  - the MA group was more authoritarian – which is consistent with tendency of authoritarians to be strict rule-followers and adhere to clinical guidelines, which in the VA (for example) specify that opioids should be used when other therapies are not effective.
  - Not surprisingly, the MA group expressed a more positive attitude toward opioids, which suggests that education about safety and efficacy of opioids may be successful in changing practice.

Discussion

- Compared to the low action group…
  - MA physicians had a more positive attitude towards opioids, and were more likely to believe that chronic pain has a physical cause.
    - This belief is widely endorsed by chronic pain patients, and often a source of conflict between physicians and patients.
    - This finding suggests that changing some physicians' beliefs about the source of some patients' pain may improve their treatment decisions and improve patient satisfaction with the quality of the medical encounter.
  - MA physicians were more likely to report having adequate consultation/referral resources, suggesting physicians use multiple modes of treatment if those resources are available to them.

Discussion

- Compared to the low action group…
  - the MA group felt that the patient was less trustworthy.
  - MA physicians were more likely to be concerned about the effectiveness of opioids.
- It is noteworthy that the group most likely to advocate opioids has more misgivings about its use and trust the patient less than other groups
- Perhaps lack of trust and concern about effectiveness contributed to decision to use opioid alternatives and refer for other care in addition to opioid therapy among "rule followers"

Limitations

- Non-response (60%) typical, but makes external validity difficult to assess.
- The sample was mostly Non-VA physicians, so difficult to know whether patient's veteran status influenced physicians differently than it would a VA physician or if their institutional model of care differed from VA.
- Do not know if these patterns are valid if the symptoms are new; our patient was already using opioids.
- Latent class models and other latent models can have multiple interpretations