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## Patient-reported pathways to opioid use disorders and pain-related barriers to treatment engagement

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### Abstract

**Background**—Risk factors associated with developing opioid use disorders (OUD) are documented, but less is known about different pathways to initiation of opioids or opioid dependence, or how such pathways affect treatment engagement.

**Methods**—We recruited 283 adults with electronic medical record (EMR) evidence of opioid dependence diagnoses. Open-ended and structured interview items focused on prior opioid treatment experiences, barriers to and knowledge of treatment options. Interviews were audio-recorded, transcribed, and coded. In exploratory analyses, we used a modified grounded theory approach to organize emergent, patient-reported themes describing participants' perceived pathways to opioid dependence.

**Results**—121 participants described one or more pathways to OUD. Qualitative analyses revealed five pathway themes. Three pathways were related to pain control: inadequately controlled chronic pain, exposure to opioids during acute pain episodes, and chronic pain among individuals with prior substance use disorders. A fourth pathway included individuals for whom opioids provided relief from emotional distress; the fifth related to recreational or non-medically supervised opioid use. We identified pain-related barriers to reducing/stopping opioids and treatment engagement barriers among individuals who perceived themselves solely as pain patients.

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**Conclusion**—Patients’ perceptions of inadequately controlled pain, patients’ previous substance use disorders, and the relief from emotional distress that some patients feel while using opioids are relevant when making clinical decisions about whether to initiate or sustain opioid therapy, and for how to monitor certain individuals. Among individuals with pain and OUD, treatment barriers include fear of uncontrolled pain, and stigmatization of being treated alongside people with non-medical opioid use.

### Keywords

opioid use disorder; opioid addiction treatment; treatment barriers; stigma; emotional distress; qualitative research

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## 1. Introduction

The prevalence of individuals with opioid use disorders (OUD) in the United States has grown over the past decade and remains stubbornly high despite efforts to reduce prescription opioid misuse and abuse and heroin use (Substance Abuse and Mental Health Services Administration, 2012, 2014). Fueled in part by increased prescribing of opioid analgesics (Centers for Disease Control and Prevention, 2011; Paulozzi, Strickler, Kreiner, & Koris, 2015), and a parallel rise in heroin use across the country (Cicero, Ellis, & Surratt, 2012; Coplan, Kale, Sandstrom, Landau, & Chilcoat, 2013; Jones, Logan, Gladden, & Bohm, 2015), the need to understand how opioid use disorders develop is a critical public health issue.

Demographic characteristics associated with risk of OUD are known (Cochran et al., 2014). We also know that individuals with certain experiences—chronic pain, mental health diagnoses, and prior substance use problems—are at increased risk for developing problematic opioid use when treated with opioids (Chou, Fanciullo, Fine, Miaskowski, et al., 2009; Edlund et al., 2010; Rice et al., 2012). Once an OUD has developed and an individual has engaged in treatment, we know that those with prescription opioid use disorders tend to have better outcomes than individuals with heroin-only or heroin and prescription opioid problems; they are more likely to complete treatment and have fewer opioid-positive urine samples (McCabe et al., 2013; Nielsen, Hillhouse, Thomas, Hasson, & Ling, 2013; Potter et al., 2013).

However, less is known about how individuals arrive at problematic opioid use, or about how one’s pathway to an OUD affects treatment engagement or engagement-related barriers. In the absence of prospective studies documenting the processes by which individuals develop opioid dependence, patients’ recollections of their pathways to an OUD—though vulnerable to limitations of self-reported historical data and the potential for social desirability to distort recollections—serve as a starting point for developing a deeper insight into how individuals understand their substance-related problems, and the ways in which these explanatory models affect treatment. This information may be helpful in preventing OUDs in others, discerning who is most vulnerable to opioid dependence, and providing tailored, person-centered treatment.

This qualitative analysis is part of a larger mixed-methods study designed to understand the adoption of buprenorphine as a medication-assisted treatment option. Our prior work has described health system use (McCarty et al., 2010) and costs associated with opioid treatment (Lynch et al., 2014), health care provider experiences with adopting buprenorphine as an OUD treatment option (Green et al., 2014), and patient-reported opioid agonist treatment preferences (Yarborough et al., 2016). The aim of the current paper is to document individuals' explanatory models for how they developed an OUD—and, for some, how these models affected treatment engagement. We use emergent findings from semi-structured interviews conducted among a large sample of insured individuals with electronic medical record (EMR) evidence of any type of OUD diagnosis (i.e. heroin and/or prescription opioids, prescribed or not prescribed).

## 2. Material and methods

The Treatment Options Study (TOP) was a mixed-methods study of the adoption of buprenorphine in two health systems—Kaiser Permanente Northwest (KPNW) and Kaiser Permanente Northern California (KPNC). Both health systems provide inpatient and outpatient medical, mental health and addiction medicine care. Goals of the study included understanding patient experiences with, and preferences for, opioid use disorder treatment (Yarborough et al., 2016) and health care provider beliefs about buprenorphine treatment for OUD (Green et al., 2014). Data was derived from the EMR (health care utilization, diagnoses, comorbidities), and structured questionnaire and semi-structured interviews with patients with opioid use disorders.

### 2.1. Eligibility

Eligible individuals were 18 years of age and older with a minimum of two opioid dependence diagnoses recorded in the EMR during an encounter in the 12 months preceding recruitment. It is common to require two instances of a diagnosis when identifying a sample from the EMR as it greatly reduces misidentification based on a single instance of the diagnosis. Opioid dependence diagnoses could have been made by any clinician treating the patient, e.g. primary care, addiction medicine, or other specialist providers. Individuals were eligible for the study based on diagnoses rather than treatment status. Participants with a history of opioid dependence or who were in remission were included in the study, as were individuals with two diagnoses but no current or limited treatment. All participants provided informed consent prior to participation; the study was approved and monitored by the KPNW and KPNC Institutional Review Boards. We excluded individuals who were unable to provide consent due to cognitive impairment.

### 2.2. Recruitment

EMR data were reviewed monthly to identify patients with opioid dependence diagnoses. Recruitment letters (n=965) were sent to Addiction Medicine department chiefs who were asked to sign and return letters for patients deemed suitable for recruitment and to return letters, unsigned, for patients deemed unable to participate (n= 226 patients, 23%). Chiefs excluded patients who were unavailable, unable to consent, or whose condition was not currently suitable to participation. Though not typical of all studies, we engaged the chiefs

of Addiction Medicine for two reasons: to avoid engaging patients who may have been in an early or vulnerable stage of treatment, and to improve recruitment rates by having chiefs demonstrate their support for the study. Recruitment letters described the purpose of the study as “to learn about treatment for patients dependent on opioids.” The letters invited participation in a single in-person interview and offered a \$50 gift card to a local one-stop shopping store. After one week, we telephoned patients to ascertain interest. The enrollment goal of 265 participants (>125 per health system) was exceeded before sending the final 32 letters. Of 707 letters mailed, 277 patients (39%) were never reached, 94 (13%) refused to participate, and 53 (7%) were deemed ineligible after attempting to contact them (e.g., moved out of area; non-English speakers). We enrolled 283 individuals, representing 40% of eligible participants, a 66% cooperation rate among individuals with whom we made contact.

### 2.3. Interview content

A semi-structured interview guide was used to assess prior experiences with OUD treatment, knowledge/attitudes about methadone, clonidine and buprenorphine, treatment preferences, barriers to obtaining OUD treatment, and treatment costs. Interviews were conducted face-to-face, typically in a health plan facility of the participants’ choosing. Interviews were conducted by Master’s-level trained interviewers with significant experience working with individuals who have mental illnesses and substance use disorders. Hour-long interviews were audio-recorded and transcribed verbatim. The first half of the interview guide began with open-ended interview items such as “Have you ever been treated in any addiction treatment (chemical dependency) program? Could you tell me a little about your most recent treatment? What substances were you getting help for? Could you tell me about any medications you considered taking as part of your treatment and what you thought about them?” No items specifically asked patients to identify their opioid dependence pathways or to provide a detailed history of their opioid use (see supplemental materials for the full interview guide; **note to editor: add link here**). The second half of the interview included interviewer-administered questionnaire items. Those reported in this paper include items assessing lifetime heroin use and prescription opiate use (in ways other than they were prescribed), both reported as yes or no. Past year drug problems were recorded yes/no in the same manner. Four yes/no items assessed history of the following addiction treatments: methadone, buprenorphine, outpatient/intensive outpatient, and residential. Current treatment (past 90 days) was assessed using one item: “Are you currently (or have you recently been) in treatment?” Responses were yes/no. Three items captured self-reported pain in the sample. First, “How often do you experience pain?” had seven responses ranging from “less often than once a month” to “at all times.” Second, “How much bodily pain have you had during the past 4 weeks?” included responses of none, very mild, mild, moderate, severe and very severe. Finally, “Thinking about the last time you experienced pain, please give me a number from 0–10 to indicate the intensity of your pain;” higher numbers represented greater amounts of pain.

### 2.4. Analyses

After completing ten percent of interviews, investigators began independently reading and coding transcripts using inductive, open coding techniques. Open coding begins with reading

the text and noting broad concepts or themes being expressed, and often involves writing short memos in order to organize thoughts around those concepts (A. L. Strauss & J. Corbin, 1998). We compared initial open codes across coders and used this information to develop descriptive codes and definitions for each code. Descriptive codes are applied to elements of text which offer illustrative descriptions, or counter-descriptions, of concepts as described by participants (Saldaña, 2009).

We coded additional transcripts, refining or adding codes and definitions as needed, using Atlas.ti software (Friese, 2011). Coders met weekly to review new transcripts, discuss coding, and resolve discrepancies. Check coding was completed on 10% of transcripts (n=12 of 121) included in these analyses; three coders were in agreement 84% of the time. To find patterns in the narratives, we used a modified grounded theory approach (Glaser & Strauss, 1967; Saldaña, 2009; A. Strauss & J. Corbin, 1998), including constant comparative methods (Glaser & Strauss, 1967).

Instances of text coded with our descriptive code “opioid problems—development & identity” were reviewed in order to identify patterns in responses which suggested processes common across individuals (Saldaña, 2009). For the analyses reported here, 121 unique individuals described the origin of their opioid dependence in a manner that could be coded as a pathway. This resulted in 128 recorded pathways; seven individuals reported pathways with distinct elements of two of our themes (no individual reported more than two pathways). It is important to understand that findings reported here, resulting from descriptive coding and subsequent sub-theme coding, are emergent rather than confirmatory. That is, we had no *a priori* hypotheses related to pathways, participants were not asked to describe their pathway to opioid dependence, and they may have described further pathways or combinations of pathways if they had been asked directly.

Analyses presented in Table 1 were calculated using SPSS v.22 (IBM). Comparisons between those who did not report a pathway to OUD (n=162) and those in our analyses who did (n=121) were conducted using chi-square tests for categorical variables and t-tests for continuous variables.

### 3. Results

A slight majority of participants in the subsample included in these analyses (n=121) were female (n=66; 55%); 8% reported Hispanic ethnicity (n=10) and 15% reported race as non-white (n=18). Mean age was 39 years (SD=13). Individuals had past 12 month problems with prescription opioids (n=87; 72%), heroin (n=21; 17%) or both (n=10; 8%); the remainder did not report past year problems with opioids but may have reported other problematic drug use (see Yarborough et al., 2016). Lifetime experiences with prescription opioids, heroin, or both, were significantly higher. Most participants (75%, n=91) were currently (past 90 days) being treated for addiction or substance use disorder; 98% (n=118) had a history of addiction treatment with methadone, buprenorphine, outpatient and/or residential treatment. Daily or constant pain was reported by 56% (n=68) of the sample; 23% (n=28) reported that pain interfered with work in the past four weeks.

The subsample included in the qualitative analyses presented here differed from those we interviewed but who did not spontaneously report a pathway to OUD in that they reported greater lifetime (98% vs. 93%,  $p=.022$ ) and past year problems (72% vs. 53%,  $p=.001$ ) with prescription opioids. Importantly, participants in our subsample did not differ on any other characteristics, including age, gender, race, heroin use, treatment experiences, or pain. See additional demographic details in Table 1.

### 3.1. Pathways to opioid use disorders

From the 121 unique individuals who reported OUD pathways, five pathway themes emerged. Though patients were selected only on the basis of the presence of any opioid use disorder, not specifically related to prescription drug misuse, many participants in our sample described a pathway to their opioid use disorders that began with a need for pain control.

**3.1.1. Pathway 1: Inadequately controlled chronic physical pain leads to misuse (n=21)**—Some participants described the origin of their problematic opioid use as entirely related to attempts to control physical pain. Some reported they had escalated the dose of their medication when they felt their pain was not well-controlled. For example, after working with physicians, this woman described how she began misusing her medication:

“...After being on [oxycodone/acetaminophen] a year and a half, I felt like it wasn't working anymore. [Doctor] said 'No, no, don't lose [hope] - OK, you take eight' ...I was still taking that amount, but I couldn't make that pain go away, so I began to take more, thinking I could cure myself, instead I land up here [treatment] ...I would never wish that on anybody.”

Other participants held their prescribers responsible for dose escalation that led to dependence:

“I remember going to the pharmacy...and after talking to the doctor and knowing that fibromyalgia isn't something that can be cured or is gonna go away, thinking to myself...I can't do this for the rest of my life...Oh, my god! And I'm crying and the pharmacist walks over and says to me, 'Don't worry. The doctors know what they're doing. They are not gonna make you get addicted to this stuff, no matter what. They are experts' ...I was still in pain. So they switched that to oxycodone and [extended release oxycodone]...I was totally depressed because of my pain... but I [didn't] want to be on these pills forever. So I called and arranged to get put into a detox...”

**3.1.2. Pathway 2: Some individuals are vulnerable to opioid dependence even after brief opioid exposure (n=14)**—Some individuals described how acute episodes of pain, due to injury or surgery, led to problematic opioid use. For example, following an outpatient procedure, one woman describes her quick path to misuse:

“I never was one that experimented or did drugs, or even really drank a lot...but four years ago, I had gastro-bypass surgery, and that's when I got hooked on

[hydrocodone/acetaminophen]. They gave me the liquid [version]. I liked it. And it kind of went from there.”

Acute dental pain and brief exposure to analgesics was another pathway to developing an opioid problem:

“I was 18, I got my [wisdom] teeth pulled then I got a script for [hydrocodone/acetaminophen] and then just pretty much fell in love with it...my first reaction [was to] take more than...two, I'd take six, you know, that's just my mentality at the time. So, I did and [it] felt great for a minute; from that point...something clicked inside of me and that's how I wanted to feel all the time.”

**3.1.3 Pathway 3: Prior substance use problems and introduction of prescribed opioids (n=18)**—Some participants described themselves as former “addicts” or related how they felt their “addictive side” re-emerged after initiating pain treatment with prescription opioids. As one woman with a self-reported problematic substance use history involving marijuana, alcohol and speed (but not opioids) described:

“I've gotten bad headaches since elementary school...and I had a doctor who [would] give me a shot of [meperidine hydrochloride]. Then she stopped doing her practice and she switched me to a different doctor. That doctor said, “I don't do injections in the office so here's a prescription for 20 [meperidine hydrochloride] to take home and here's a prescription for 100 [hydrocodone/acetaminophen]. I wasn't very honest about I'm an addict...I think I told her I did have a history, but, I don't know if she just didn't understand addiction and I just didn't bother hammering home, ‘No, you really shouldn't give me those.’...I went ahead and took them. And, yeah, I was able to refill those WAY too often.”

Similarly, a middle-aged man described how a work injury and the introduction of opioids ended his 13-year recovery from heroin addiction:

“I was an IV drug user pretty much from 17 to 27 [years old]...I was clean and sober for...12 to 13 years and I still considered myself clean and sober, even though a doctor prescribed me some [hydrocodone/acetaminophen] because I really did injure my neck at work...I knew I probably shouldn't, but I was in serious pain...And then it became a recurrent chronic deal ...I had some [very stressful] things happen in my life...I started being more active in my pursuit of [hydrocodone], would manipulate my doctor...and started paying for them...I knew that the addiction was back...”

**3.1.4 Pathway 4: Relief from emotional distress reinforces misuse or abuse (n=26)**—A subset of participants initiated opioids to control physical pain but subsequently realized that the medications helped ease emotional distress. Participants reported feeling more energetic, better about themselves, and less depressed.

“I was taking care of my dad during the day, and my mom, and working the night shift as a nurse. And I hurt my back, and it seemed like at that point...my body just went through this chronic pain thing...I found that the pain medication made me feel better; not just relieved the pain, made me feel better, like it treated the

depression, or whatever. And so then I would take them and, of course, you have to take more and more and more, you know.”

Another man described escalating opioid use in response to an unexpected traumatic event. With a hydrocodone/acetaminophen prescription already in hand to treat migraines and musculoskeletal pain, he described his attempts to cope with sudden loss:

“...after my son died [unexpectedly], I hit the [hydrocodone/acetaminophen] pretty hard...the prescription was for four a day...for pain. And, I was taking quite a bit more than that...You know, I was self-medicating...it just kind of numbed me to what was going on around me. I was able to kind of deal with my wife and her problems, and everything else.”

Finally, one woman described the moment she realized she felt better after taking opioids, originally prescribed for pain related to endometriosis:

“I ended up finding out, one day many months later, that I...really like the [hydrocodone/acetaminophen]...It really wasn't working to treat that pain...I just had a horrible day and I had the [opioid], and I actually had a drink on top of it... You know, that's when I first realized...this is something I like.”

**3.1.5. Pathway 5: Recreational initiation or non-medically supervised use of opioids (n=49)**—Some individuals described their initiation into opioid use as purely recreational. Some described a direct pathway that began with exposure to heroin; others began by taking prescription opioids recreationally. As one young man stated:

“Beginning of my senior year... I found [my mother's] prescription of extra strength [hydrocodone/acetaminophen], in her purse. And I took four of them after a football game...I was on top of the world...from there on I just really got really deep into them until I was nineteen...all my money was going towards buying pills...[or] I would go and say I got in a car accident...If I couldn't buy any [pills], I'd break my hand and go sit in the ER... And then I got introduced to heroin. And it was cheaper and easier to get...”

Still others reported gaining opioids ostensibly for pain relief, but they sought them from non-medical sources, typically family or friends, to self-treat their pain:

“At the end of the shift my arm hurt really, really bad and from that point on I would wake up in the middle of the night with excruciating pain. I didn't have any medical benefits at the time. A friend of mine said, try one of these. It might help you. It was an [extended release oxycodone]. It was a forty-milligram and about half an hour later, that's really amazing. Then the next day, do you want another one? Sure. Then the next day there was two of them and the next day there were two of them and sometimes three...[She] had a prescription of them. She wasn't trying to get me addicted. She was just trying to help me.”



### 3.2. Treatment-related barriers

We found that some patients who reported pathways related to chronic pain management also reported treatment barriers that differed from those of individuals who initiated heroin or prescription opioids recreationally.

**3.2.1. Fear of uncontrolled pain may inhibit efforts to reduce opioids or seek addiction treatment**—The fear of uncontrolled pain and anticipation of pain was a barrier to OUD treatment for some with chronic pain. For example:

“I just never got off the pain killers...the pain is excruciating without anything... The solution is just staying on the medication...I’ve talked to my doctor...about just putting me on a weekly program to where I can only fill it once a week and that way I don’t over-take it [methadone]...like if I overdo it one week, at least I’m only out a day or so. But, if I have the whole month...then I have to go a few days without anything and with the pain that I deal with I just - it’s impossible.”

In a discussion around switching from methadone maintenance to trying buprenorphine, one individual described her concern about pain this way:

“I’m afraid I may have done some permanent damage to my pain receptors...just the level of pain I experience every time I’ve tried to detox...it’s not so much being sick, it’s the level of pain. It’s just incredible...a lot of people consider [70mg] a high level of methadone...and I’m still in an enormous amount of pain. I take a hundred and thirty milligrams a day to contain the pain right now.”

Finally, in a discussion about going “drug-free” rather than remaining on methadone maintenance, one individual described the problem:

“I was trying to get off of methadone completely...and when I got down to about ten milligrams, all of a sudden the pain started surfacing and I realized how debilitating it was... after so many years of not really feeling it much, I had this like subconscious thing going on that it must have healed...I can tell you now that that pain is not the same as when you take everything away completely...It’s pretty severe.”

**3.2.2. Stigma of addiction**—Participants who traced the source of their OUD to pain viewed themselves differently than “others” with the same OUD diagnosis. For example:

“... a lot of people who abuse opiates, abuse several other...prescription medications...put it with a sedative or a muscle relaxant or something like that, and I never did that, and the people who do that, I think, have a harder time stopping their addiction or recovering from that addiction...and those are the people I think that really need early [treatment or] people who are combining...their prescription opiates with illicit street drugs, or the people who are doing illicit street drugs on their own, or the people who are...alcoholics...I really don’t need early recovery to try to prevent me from relapsing because you’re [HMO pharmacy] not giving it to me anyway....so I felt after...we started to get a grip on the chronic pain, I felt I

really didn't need the aftercare [follow-up outpatient substance abuse treatment]. I wasn't, and excuse me for the term, I wasn't a crackhead..."

Another woman reported a very difficult time reconciling her public identity with that of someone who had to participate in "demoralizing" treatment alongside others she felt to be very different from her:

"Outpatient methadone program was probably one of the most...demoralizing things I've ever had to go through...I'm a soccer mom. [Chuckles] And, I also... have major, serious addiction issues. But at the clinic, I've never felt more like a drug addict in my life...I just didn't have a lot in common with the majority of the clientele there...my lifestyle, my life circumstances were different...If I had been there ten years [earlier], it would have destroyed me. I have a little more strength and I'm a little more mature, so I was able to hold on to my own identity while I was there...I would leave there feeling like...'a junkie'...People offered me drugs there...They knew I was in pain...That's how I ended up there. They would offer me their drugs. They're not even trying to get clean. It was horrible."

Finally, another woman, once engaged in treatment, wanted to be treated like someone who had become addicted to "medicine" as opposed to being an "addict:"

"I guess I would like to have been treated less like an addict and more like a person who had chronic pain who got addicted to pain medicine...I recognized when I started slipping into addiction versus just taking the pain medicine for pain. But I still would have liked to have been treated more like a pain management person who got addicted to her medicine than an addict..."

#### 4. Discussion

Participants in our sample of insured individuals with opioid use disorders spontaneously described pathways to opioid misuse or dependence, and barriers to treatment. Consistent with previous research, we found that chronic pain, and the fear of inadequately controlled pain, were pathways to OUD (Weiss et al., 2014) and also created barriers to treatment (Winstock, Lintzeris, & Lea, 2011). Given the perception among some in our sample that poorly controlled pain was a driver of opioid misuse, it would seem critically important for prescribing clinicians to help their patients with pain to set realistic expectations for pain management; identify specific pain control and functional goals, and identify coping resources; invite clear and frequent communication about how adequately the opioid prescription is or is not relieving pain and improving functioning; and to monitor closely for signs of misuse. It may be particularly useful for future research to explore the differences between patients' perceptions of inadequately controlled pain and reported hypersensitivity to pain (e.g. hyperalgesia) (Angst & Clark, 2006; Chang, Chen, & Mao, 2007), that some of our participants reported as they tapered doses or changed OUD treatment medications.

We found that, for some, even short-term exposure to opioids for an acute injury, brief episode of pain, or dental or surgical procedure could open up a pathway to opioid dependence. Recent changes to opioid prescribing guidelines could reduce this route of exposure as new recommendations on first line treatment, dosage, and duration have

narrowed quite considerably (Dowell, Haegerich, & Chou, 2015; Olsen, 2016). However, any exposure to opioids for some individuals, regardless of how short, may still lead to problematic use. Further research on which characteristics make some individuals vulnerable while others can successfully complete a short-course of opioids without developing problematic use is warranted.

Some participants who were prescribed opioids for pain, and others who used opioids recreationally, reported that opioids alleviated emotional distress thus reinforcing misuse and/or abuse. Other researchers have described the increased risks of opioid misuse among those with mental health diagnoses (Back, Lawson, Singleton, & Brady, 2011; Barth et al., 2013; Grattan, Sullivan, Saunders, Campbell, & Von Korff, 2012; Wawrzyniak et al., 2015) but our study provides more in-depth evidence of the process by which some people found relief from emotional distress as a byproduct of treating physical pain. Though not indicated for or prescribed to treat emotional distress, clinicians and researchers should be aware that patients may be using opioids for this purpose. Our results suggest that ongoing monitoring of emotional and mental health may be very important for certain patients. We echo recommendations (Chou, Fanciullo, Fine, Adler, et al., 2009) that clinicians screen for mental health problems prior to initiating opioids, and consistently monitor changes in mental health during use. Clinicians should also expect that individuals may experience psychiatric distress during opioid tapering or treatment (Howe & Sullivan, 2014), and that some individuals may have no prior experience with recognizing mental health needs or accessing treatment.

Prior substance use problems among individuals seeking pain treatment created another vulnerability to OUD, underscoring the difficulty in treating chronic pain among those with past substance use disorders (Morasco, Duckart, & Dobscha, 2011; Neumann et al., 2013). Our results support the importance of understanding an individual's prior substance use history and risks before prescribing opioid medications (Edlund et al., 2010; Edlund et al., 2014; Rice et al., 2012) though we acknowledge, and observed in our interviews, that patients may not always be forthcoming about past substance use disorder history. Meeting patient-centered needs for pain control while also reducing risks related to misuse and abuse such as overdose or death has proven to be particularly challenging for clinicians (Kampman & Jarvis, 2015; Neumann et al., 2013). Buprenorphine/naloxone may be a reasonable approach for patients with co-occurring chronic pain and an OUD as it adequately controls pain for some individuals while simultaneously addressing addiction (Roux et al., 2013). Such an approach could help alleviate patient concerns about uncontrolled pain.

We found that the distinction between individuals with and without substance use histories is important, not only for clinicians, but for patients as well. Among those with OUD but without prior substance use histories, our results identified barriers to treatment when individuals self-identified as "pain patients" rather than as someone with a drug problem. Similar to findings from Radcliffe and Stevens' (2008), participants in our sample felt they did not fit in with individuals they encountered in treatment and felt stigmatized by being associated through shared treatment services (Olsen & Sharfstein, 2014). As prescription-related opioid use disorders have increased (Edlund et al., 2014; Substance Abuse and Mental Health Services Administration, 2014) this experience may be increasingly common.

Our results present preliminary evidence that separate addiction outpatient therapy groups may be helpful in reducing barriers to treatment engagement.

Finally, a number of individuals in our sample reported they initiated heroin or prescription opioids (without a prescription) to feel better or to get high. A discussion on why some individuals initiate heroin use recreationally (without any prior reported exposure to prescription opioids) is beyond the scope of this paper. However, individuals who initiate prescription opioids without a prescription are a population at high risk for switching to heroin use (Banerjee et al., 2016). Researchers are starting to identify critical moments during which prescription misuse can turn to heroin use (Harocopos, Allen, & Paone, 2016). Limiting the opioid supply and increasing the efficacy of patient education (e.g., important safety practices, locking up medications to prevent diversion) could help to make progress in keeping opioids from individuals vulnerable to recreational use. This strategy might also help some individuals avoid heroin initiation by reducing their initial exposure to prescription opioids obtained through friends or family. If effective, new prescribing guidelines (Dowell et al., 2015) should have an effect on the overall prescription opioid supply which, to date, remains very high (Paulozzi, Mack, & Hockenberry, 2014). Total opioid supply notwithstanding, patient education regarding safe use of opioids, including not sharing them with anyone else, is still insufficient (McCarthy et al., 2015). Increasing educational touch points, including pharmacists (Cobaugh et al., 2014) and nurses (Manworren & Gilson, 2015), could be helpful in reinforcing core messages proscribing diversion or sharing even among friends and family. Additionally, further longitudinal monitoring of switches from prescription opioids to heroin is also warranted. Several manufacturers have changed opioid formulations to ostensibly make them more abuse-deterrent. Some evidence has shown that abuse rates of reformulated products did indeed drop, but that there were corresponding increases in the abuse of other opioids (Coplan et al., 2013; Severtson et al., 2013).

Future research should seek to validate our findings on relief from emotional distress, and could elaborate on how to help vulnerable individuals get appropriate pain relief. As our sample consisted entirely of individuals with opioid use disorders, we are not able to assess protective factors which might inhibit development of OUD. As many individuals treated for acute or chronic pain do not develop opioid use disorders, even in the face of insufficiently treated pain or experiences of emotional distress, knowing more about which individuals do not develop OUD would be helpful. The design of this current study did not allow us to do so. Further research should also be conducted on recreational pathways to OUD and treatment implications specific to those individuals. Future research should also test, quantitatively in representative samples, the associations between opioid dependence pathways and treatment engagement and treatment success outcomes.

#### 4.1 Limitations and strengths

A few limitations should be noted. First, the retrospective self-report of opioid dependence pathways may be influenced by the social desirability of patients' current treatment situation, e.g. it is more acceptable to report pathways related to pain control compared to recreational or non-medical opioid use. Second, our sample represents members of two

private not-for-profit health systems, therefore the populations studied here may not be representative of individuals receiving care in other settings. KPNW was an early adopter of buprenorphine once FDA-approved (Green et al., 2014), and this sample may include a higher proportion of individuals who began their opioid use through prescription medications, thus reinforcing findings about pain being an important pathway among individuals sampled from medical settings compared with other addiction treatment settings. Participants did report significant heroin use but may still differ from those seeking treatment through community treatment centers. Third, there was insufficient data to identify pathways for 162 participants; we may have missed something important from those individuals. Fourth, more than 200 individuals were excluded as ineligible by the chiefs of Addiction Medicine. One predominant reason for that exclusion was the current status of treatment, thus we may have interviewed individuals who were further along in treatment rather than in the beginning stages. Fifth, our sample included slightly more women than men, but this is representative of individuals enrolled in the health systems. It is possible, however, that inclusion of more men would have provided additional data important to recreational pathways as heroin users are more likely to be men (Jones et al., 2015). Sixth, we did not verify diagnoses of enrolled participants, but more than 97% of the sample reported lifetime engagement in addiction medicine or treatment programs. Seventh, as our findings are emergent, more targeted questions specifically assessing opioid pathways, for individuals with primary prescription or heroin dependence, might yield different or additional findings.

Two particular strengths of this study include the large sample size and the inclusion of privately insured individuals who have been under-represented in existing research on opioid use disorders. As many individuals in the U.S. are covered by commercial insurance, knowing how OUD can develop in this population is critical to public health efforts to reduce opioid misuse and abuse, including heroin use.

## Conclusions

Pathways to OUD have relevance to both primary care providers and policymakers. Patients' perceptions of inadequately controlled pain, patients' previous substance use disorders, and the relief some patients feel from emotional distress while using opioids are relevant when making clinical decisions about whether to initiate opioid therapy, and how to monitor certain individuals. As prescribing guidelines evolve, primary care clinicians remain important gatekeepers for opioids and are uniquely positioned to monitor their use and misuse. It is hoped that new guidelines and federal and state policies can alleviate some of the pathways reported here, including reducing the opioid supply and strengthening patient education on appropriate opioid use and safety. Even with new prescribing guidelines, individuals will continue to need and be prescribed opioids for pain control. Routine monitoring of mental health during the course of pain treatment and treatment of opioid use disorders will be important as emotional distress can encourage some to misuse opioids while depression and fear of pain can prevent others from actively engaging in treatment. Finally, using office-based treatments such as buprenorphine/naloxone, may reduce treatment-related stigma and facilitate treatment engagement for some individuals.

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### Highlights

- Acute pain, chronic pain, and emotional distress play different contributing roles in developing opioid dependence.
- Pain patients face distinct barriers to reducing or stopping opioids and engaging in treatment compared to individuals without pain.
- Understanding pathways to opioid dependence may improve patient-centered care and reduce treatment-related barriers.

**Table 1**

Participant demographic, treatment, and health characteristics, by inclusion status in qualitative OUD pathways analyses (N=283)

	Included in analyses (n=121)		Not included in analyses (n=162)		P	
	Valid n	n	%	n		%
Female	281	66	55	90	56	.435
Hispanic ethnicity	282	10	8	15	9	.465
Race <sup>1</sup>						
Native American	283	6	5	6	4	.408
Asian	283	2	2	2	1	.573
Native Hawaiian	283	2	2	1	1	.392
African American	283	8	7	5	3	.133
White	283	106	88	148	91	.202
Education	282					.585
Some high school, HS graduate or GED		33	27	43	27	
Some college or technical school		68	56	89	55	
College graduate		15	12	26	16	
Post graduate		5	4	3	2	
Employment status	281					.734
Currently employed		64	53	94	59	
Employed before entering treatment, but not currently		9	7	9	6	
During the past 12 months		24	20	26	16	
Longer than 12 months ago		24	20	31	20	
Lifetime opioid use <sup>2</sup>						
Prescription opioids	282	119	98	149	93	.022
Heroin	282	57	47	74	46	.472
Both	282	55	46	68	42	.322

	Included in analyses (n=121)		Not included in analyses (n=162)		P	
	n	%	n	%		
Past-year opioid problems <sup>2</sup>	Valid n					
Prescription opioids	283	87	86	53	.001	
Heroin	283	21	36	22	.195	
Both	283	10	17	11	.337	
Past 90 days addiction/chemical dependency treatment	283	91	119	74	.424	
Lifetime opioid treatment <sup>2</sup>						
Medication-assisted						
Methadone	270	46	68	44	.236	
Buprenorphine	272	66	87	56	.531	
Both	269	23	36	22	.306	
Neither	269	29	35	22	.371	
Other						
Outpatient/intensive outpatient	277	95	129	82	.409	
Residential	270	61	71	46	.176	
Any of the four <sup>3</sup>	283	118	157	97	.455	
Pain <sup>2</sup>						
Experience pain daily or at all times	280	68	81	50	.181	
Severe or very severe in past 4 weeks	283	19	30	19	.324	
Interfered with work quite a bit/extremely in past 4 weeks	281	28	37	23	.532	
Age, years		Mean	SD	Mean	SD	P
	280	38.8	12.7	41.0	11.8	.140

<sup>1</sup> Individuals not included in these analyses are those who did not spontaneously report a pathway to their OUD therefore could not be coded into one of our emergent themes.

<sup>2</sup> Items were not mutually exclusive and will not necessarily sum to 100%.

<sup>3</sup> The four forms of addiction treatment/chemical dependency asked about were methadone, buprenorphine, outpatient, residential. The percent reporting they had not experienced any of those forms of treatment was 2.5% in the pathways subsample.