

## CONTROLLED SUBSTANCE ABUSE AND ILLICIT DRUG USE IN CHRONIC PAIN PATIENTS: AN EVALUATION OF MULTIPLE VARIABLES

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**Background:** Opioids are used extensively for chronic pain management in the United States. The frequency of opioid use prior to presenting to interventional pain management settings and in interventional pain management settings has been shown to be above 90%. Opioid abuse has been demonstrated in 9% to 41% of patients receiving chronic pain management. Illicit drug use has been reported in 14% to 34% of patients in chronic pain management settings.

**Objectives:** To evaluate and correlate multiple variables with opioid abuse and illicit drug use.

**Design:** A prospective, consecutive study.

**Setting:** Interventional pain management practice setting in the United States.

**Methods:** A total of 500 consecutive patients prescribed opioids, considered to

be receiving stable doses of opioids supplemental to their interventional techniques were evaluated for opioid abuse and for illicit drug use.

Abuse was defined as a patient receiving controlled substances from any source other than the prescribing physician at our center with the exception of controlled substances for acute injuries unrelated to the problem being treated, or for emergencies.

Urine drug testing for illicit drugs was performed by urine rapid drug screen (Instant Technologies, iCup® Norfolk, VA). Results were considered positive if one or more of the monitored illicit drugs including cocaine, marijuana (THC), phenylcyclohexane methamphetamine or amphetamines were detected.

**Results:** Opioid abuse was seen in 9% of patients, with illicit drug use in 16%

of patients. Significant differences were noted in the prevalence of opioid abuse in patients who developed chronic pain following motor vehicle accident(s) and in patients presenting with pain in three regions of the body. Illicit drug use (marijuana) was more common in females. Illicit drug use was also more common in patients younger than 45, after motor vehicle injury, and in patients with involvement of three regions of the body.

**Conclusion:** Opioid abuse and illicit drug use were common in chronic pain patients with a prevalence of 9% and 16%, respectively. Age, pain after motor vehicle accident, involvement of multiple regions and past history of illicit drug use were identified as risk factors.

**Key Words:** Chronic pain, controlled substances, illicit drug use, substance abuse, opioids, urine drug testing.

The misuse of controlled substances, especially those containing opiates, among the general public and in patients suffering with chronic pain is a problem attracting nationwide attention (1-3). According to the 2004 National Survey on Drug Use and Health (NSDUH), an estimated 4.4 million persons age 12 or older had used opiate pain medications non-medically in

the past month (3). The consequences of this can be severe; in 2004, opiate pain medications were involved in an estimated 158,281 emergency department (ED visits) attributed to drug misuse/abuse (1). The Drug Abuse Warning Network (DAWN) examined the involvement of opiates in deaths related to drug misuse in Maine, New Hampshire, Vermont, Maryland, Utah, and New Mexico for 2003. Total opiate misuse deaths ranged from 54 in Vermont with a population of only 619,000, to 595 in Maryland with a population of 5.5 million. The overall rates of opiate-related drug misuse deaths in 2003 ranged from 7.2 per 100,000 population in New Hampshire to 11.6 per 100,000 population in New Mexico. In five of the six states, adults aged 35 to 54 had the highest rates of opiate misuse deaths (1).

Controlled substance abuse among chronic pain patients is common (4-

24). Multiple investigators (12-16, 18-23) have shown the prevalence of drug abuse to be 9% to 41% in patients receiving opioids for chronic pain. More over, illicit drug use without controlled substance abuse was found in 14% to 16% of chronic pain patients, and illicit drug use with controlled substance abuse was present in 34% of chronic pain patients (25-28). Thus, overall use and abuse of opiates and other controlled substances in conjunction with illicit drug use appears to be prevalent not only in the general public but also in interventional pain management settings (1-37).

As many as 90% of patients in pain management settings receive opioids for chronic pain management (9, 12, 13, 36). The frequency of overall opioid use among patients with back pain was reported as approximately 12% (32). A 2001 cross-sectional analysis of analgesic use by patients with low back pain

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showed that 55.5% of insurance plan members with low back pain had claims for analgesics with 68% of those claimants receiving an opioid (35). In addition, Medicaid patients were more likely to receive prescription drugs, particularly opioids (73% Medicaid versus 40% commercial insurance), for 30 days or longer and to visit the emergency department more frequently (33). Multiple other reports (6-8, 34, 37) revealed widespread use of opioids in the management of chronic pain.

Illicit drug use and dose escalations were studied in patients receiving short-acting and long-acting opioids (10, 11) with similar results in both groups. The study demonstrated a significantly higher prevalence of abuse rates in Medicaid patients and in Medicare patients who used Medicaid as supplemental insurance (27). Opioid abuse and illicit drug use has not been studied based on age, duration of pain, mode of pain onset, involvement of regions, history of previous spine surgery, gender, insurance status, past history of illicit drug use, and psychological status.

A 2005 analysis of drug misuse and illicit drug use in 500 patients was undertaken to correlate these variables with opioid misuse and illicit drug use in patients in interventional pain management settings (23, 28).

## METHODS

The study was conducted in an interventional pain management practice. A total of 500 consecutive patients on prescribed opioids were studied.

All patients signed an informed consent for obtaining information on the drug use, for random drug testing, and for publication of results without the identification of individuals. Appropriate precautions were taken to protect the privacy and identity of patients participating in this evaluation. All the patients also signed controlled substances agreements. The controlled substance agreement included permission to contact pharmacies, physicians, etc. and to

perform random drug screening. All patients considered were receiving stable doses of hydrocodone, oxycodone, methadone or morphine as supplements to their interventional techniques. Opioids were not the mainstay of treatment.

Inclusion criteria required that patients were: willing to participate, in stable condition, and in a pain management program encompassing interventional techniques and opioid drug administration. Exclusion criteria were: an inability to understand the consent, refusal to sign the consent, a refusal to follow the terms of the controlled substance agreement to submit to random drug testing, and unstable pain control.

Following initial selection, evaluation consisted of monitoring controlled substance intake, with special attention to drugs received from outside the practice; and a past history of illicit drug use. Past illicit drug use was based on a patient's admission of such use. The data collection for this purpose included information from records, pharmacies, referring physicians, and all physicians involved in the treatment of the patients. Rapid urine drug screening (Instant Technologies, iCup® Norfolk, VA) was performed on all the patients participating in the study. The rapid drug screen is a 1-step, lateral flow immunoassay for the simultaneous detection of up to 9 drugs by urine analysis. Each analysis occupies a separate channel, intended for use in the qualitative detection of various drugs. Data was collected using a preprinted format with demographic information and drug history and was compared with all acquired information. The cut off limits for detection of illicit drugs were as follows: cocaine 300 ng/mL, amphetamines and methamphetamine 1000 ng/mL, marijuana (THC) 50 ng/mL and phencyclidine 25 ng/mL.

Abuse was defined as a patient receiving controlled substances from any place or source other than the prescribing physician at our center, with the exception of controlled substances for acute injuries unrelated to the problem

being treated or for emergencies. Trafficking was based on legal determination by court of law. Past history of illicit drug use was based on patient history. Patients were considered positive for illicit drug use, if one of the monitored illicit drugs, including cocaine, marijuana (THC), amphetamines or methamphetamine was detected.

All patients underwent rapid urine drug testing. Positive drug screen for cocaine was considered definite by rapid urine drug screen. Positive methamphetamine, amphetamine, or marijuana were checked for false-positives with a follow-up laboratory evaluation and exclusion of drugs causing false-positive results. The results of positive THC results were confirmed with laboratory testing, if a patient was on Pantoprazole (Protonix®) or denied using marijuana. The results confirmed by laboratory evaluation were considered as final.

Data were tabulated using Microsoft® Access® 2003. SPSS (version 9.0) was used to generate frequency tables. The chi-squared statistic was used to determine significant differences among groups. Fisher's Exact test was used wherever the expected value was less than 5. Prevalence and 95% confidence intervals were calculated. Student's t-test was used to determine significant differences between sexes. Results were considered statistically significant if the P value was less than 0.05.

## RESULTS

### Patient Flow

Data were evaluated for the prevalence of opioid abuse and illicit drug use in 500 patients. Overall, 566 patients were eligible, but 66 patients refused to participate in the study. All patients were evaluated for opioid abuse. Their urine also was tested for the following illicit drugs: cocaine, amphetamines, methamphetamine, marijuana (THC), and phencyclidine.

### Demographic Characteristics

Table 1 illustrates demographic characteristics encompassing age, du-

Table 1. Demographic characteristics

		Male 41% (205)	Female 59% (295)	Total (500)
Age (Years)	< 45	32% (65)	<b>42%*</b> (123)	38% (188)
	45-64	59% (121)	45% (133)	51% (254)
	≥ 65	9% (19)	13% (39)	11% (58)
	Range	25 – 77	21 – 78	21 – 78
	Mean ± SE	<b>49.5* ± 11.1</b>	48.0 ± 13.2	48.6 ± 12.4
Duration of Pain (years)	< 5	22% (44)	26% (78)	24% (122)
	5-9	29% (60)	28% (81)	28% (141)
	≥ 10	49% (101)	46% (136)	47% (237)
	Range	1 – 44	1 – 44	1 – 44
	Mean ± SE	<b>11.6* ± 9.2</b>	10.1 ± 7.5	10.7 ± 8.2
Mode of Onset	Gradual onset	28% (58)	<b>44%*</b> (129)	37% (187)
	Motor Vehicle Accident	19% (38)	21% (62)	20% (100)
	Other incident	23% (48)	22% (65)	23% (113)
	Work-related Injury	<b>30%* (61)</b>	13% (39)	20% (100)
Number of regions involved	1 region	46% (95)	29% (85)	36% (180)
	2 regions	40% (82)	<b>54%*</b> (158)	48% (240)
	3 regions	14% (28)	18% (52)	16% (80)
History Previous Spine Surgery		<b>47%*</b> (96)	27% (80)	35% (176)
Insurance Status	Third-party	37% (76)	39% (116)	38% (192)
	Medicare w/wo third-party	<b>39%*</b> (80)	25% (74)	31% (154)
	Medicare and Medicaid	14% (28)	19% (57)	17% (85)
	Medicaid	10% (21)	16% (48)	14% (69)
Past history of illicit drug use		16% (33)	16% (47)	16% (80)

\*Indicates a significant difference between male and female patients

ration of pain, mode of onset of pain, number of body regions involved, history of previous spine surgery, insurance status, and past history of illicit drug use among male and female patients.

The proportion of female patients was higher in the age group of less than 45 years (42% vs 32%), whereas the proportion of male patients was higher in the 45-64 years age group (59% vs 45%). Mean age was slightly higher for males (49.5 years vs 48.0 years)

The duration of pain was evaluated in three groups: less than 5 years, 5 to 9 years and 10 years or longer. Overall, 76% of the patients had pain for more than 5 years, and 47% had pain for more than 10 years. Mean duration

of pain was longer in males (11.6 years vs 10.1 years).

Thirty-seven percent of patients reported pain to be of gradual onset without injury. A significantly higher proportion of female patients presented with gradual onset pain (44% vs 28%). The study also showed a significantly greater proportion of males having work-related injuries (30% vs 13%).

The number of body regions involved was different between males and females. Among males 40% had involvement of one body region, whereas, a greater proportion of females presented with involvement of two or more body regions (54% vs 40%).

A history of previous spine surgery

was present in 35% of the patients. Surgery was more common among males (47% vs 27%).

Insurance status showed significant differences. Among males, a greater proportion was covered by Medicare with or without third-party insurance (39% vs 25%). Overall, 38% of patients were covered by third-party insurance, 31% were covered by Medicare, with or without third-party supplemental insurance, 17% were covered by Medicare and Medicaid, and 14% were covered by Medicaid only. A total of 48% of patients were covered by Medicare, whereas a total of 31% had Medicaid coverage.

Past history of illicit drug use by self-

Table 2. Prevalence of drug abuse and illicit drug use

	Male (205)	Female (295)	Total (500)
<b>Drug Abuse</b>			
Doctor shopping	4.4% (9)	5.4% (16)	5% (25)
95% CI	(2%, 7%)	(3%, 8%)	(3%, 7%)
Trafficking	6% (12)	3% (9)	4% (21)
95% CI	(3%, 9%)	(1%, 5%)	(2%, 6%)
<b>Total Opioid Abuse</b>	10% (20)	9% (26)	9% (46)
95% CI	(6%,14%)	(6%, 12%)	(7%,12%)
<b>Illicit Drug Use</b>			
Marijuana	7% (15)	<b>13% * (39)</b>	11% (54)
95% CI	(4%,11%)	(9%, 17%)	(8%, 14%)
Cocaine	5% (10)	5% (14)	4.8% (24)
95% CI	(2%, 8%)	(2%, 7%)	(3%, 7%)
Methamphetamine Amphetamine	1% (2)	3% (9)	2% (11)
95% CI	(0%, 2%)	(1%, 5%)	(1%, 4%)
<b>Total Illicit Drug Use</b>	12% (25)	19% (55)	16% (80)
95% CI	(8%,17%)	(14%, 23%)	(13%,19%)

\* Indicates a significant difference between male and female patients

reporting was identified in 16% of the patients, equally among males and females.

#### Opioid Abuse or Misuse

Table 2 illustrates opioid abuse characteristics. A total of 9% of patients were either doctor shopping or trafficking in opioids. There were no significant differences noted among males and females. There was an insignificant trend among male patients for trafficking and among female patients for doctor shopping.

#### Illicit Drug Use

Table 2 illustrates illicit drug use. Overall, the prevalence of illicit drug use was 16%; 19% among females and 12% among males. Marijuana use was significantly higher among females (13% vs 7%).

#### Age

Table 3 illustrates the prevalence of opioid abuse and illicit drug use among

Table 3. Prevalence of drug abuse and illicit drug use among various age groups

	< 45 years 38% (188)			45-64 Years 51% (254)			≥ 65 years 11% (58)		
	Male (65)	Female (123)	Total (188)	Male (121)	Female (131)	Total (254)	Male (19)	Female (39)	Total (58)
<b>Opioid abuse</b>	8% (5)	12% (15)	11% (20)	12% (15)	7% (10)	10% (25)	0%	3% (1)	2% (1)
95% CI	(1%, 14%)	(6%, 18%)	(6%,15%)	(6%,18%)	(3%,12%)	(6%,14%)		(0%,8%)	(0%,5%)
<b>Illicit Drug Use</b>	15% (10)	<b>31%* (38)</b>	<b>25%* (48)</b>	12% (15)	13% (17)	13% (32)	0%	0%	0%
95% CI	(6%, 24%)	(23%,39%)	(19%,32%)	(6%,18%)	(7%,19%)	(8%,17%)			

\* Indicates a significant difference between male and female patients within the age group

# Indicates a significant difference among the age groups

Table 4. Prevalence of drug abuse and illicit drug use based on duration of pain

	< 5 years 24% (122)			5-9 Years 28% (141)			≥ 10 years 48% (237)		
	Male (44)	Female (78)	Total (122)	Male (60)	Female (81)	Total (141)	Male (101)	Female (136)	Total (237)
<b>Opioid abuse</b>	7% (3)	9% (7)	8% (10)	10% (6)	10% (8)	10% (14)	11% (11)	8% (11)	9% (22)
95% CI	(0%,14%)	(3%,15%)	(3%,13%)	(2%,18%)	(3%,17%)	(5%,15%)	(5%,17%)	(3%,13%)	(6%,13%)
<b>Illicit Drug Use</b>	16% (7)	22% (17)	20% (24)	12% (7)	16% (13)	14% (20)	11% (11)	18% (25)	15% (36)
95% CI	(5%,27%)	(12%,31%)	(12%,27%)	(3%,20%)	(8%,24%)	(8%,20%)	(5%,17%)	(12%,25%)	(11%,20%)

various age groups. There was significantly higher illicit drug use in the group less than 45 years (25% vs 13% vs 0%), whereas patients 65 years of age or older showed no evidence of illicit drug use. In addition, a significantly greater proportion of illicit drug use was seen in female patients (31% vs 15%).

**Duration of Pain**

Table 4 illustrates the prevalence of opioid abuse and illicit drug use based on the duration of pain in years. Patients were identified into three groups with

pain duration of less than 5 years, 5 to 9 years, and 10 years or greater. No differences were noted among the groups.

**Mode of Onset of Pain**

Table 5 illustrates the prevalence of opioid abuse and illicit drug use based on the mode of onset of pain: gradual onset, pain after motor vehicle injury, pain after other incident(s), and pain after a work-related injury. Opioid abuse and illicit drug use were seen more commonly (16% and 24%) in patients who had pain due to motor vehi-

cle accidents.

**Involvement of Number of Regions of Body**

Table 6 illustrates details of drug abuse and illicit drug use based on the number of body regions involved. Patients with involvement in three regions showed a higher prevalence of opioid abuse and illicit drug use compared to patients with involvement in one region (14% vs 5% for opioids and 22% vs 13% for illicit drug use).

**History of Previous Spine Surgery**

Table 7 illustrates opioid abuse and illicit drug use based on previous surgical intervention on the spine; no significant differences identified.

**Insurance Status**

Table 8 illustrates opioid abuse and illicit drug use based on insurance status. Opioid abuse was seen in a greater proportion of males covered by Medicare with or without third-party insurance (11% vs 3%).

**Past Illicit Drug Use**

Tables 9-11 illustrate opioid abuse and illicit drug use based on previous history of illicit drug use. A significant correlation was identified between a past history of illicit drug use and current illicit drug use. Indeed, 51% of patients with a past history of illicit drug use were current illicit drug users. Table 10 illustrates the relationship between current illicit drug use and current opioid abuse.

Table 5. Prevalence of drug abuse and illicit drug use based on mode of onset of pain

	Opioid Abuse		Illicit Drug Use	
	Patients	95% CI	Patients	95% CI
Gradual onset 37% (187)				
Male (58)	17% (10)	(7%, 27%)	12% (7)	(4%, 21%)
Female (129)	8% (11)	(4%, 13%)	12% (15)	(6%, 17%)
Total (187)	11% (21)	(7%, 16%)	12% (22)	(7%, 16%)
Motor Vehicle Accident 20% (100)				
Male (38)	18% (7)	(6%, 31%)	16% (6)	(4%, 28%)
Female (62)	14% (9)	(6%, 23%)	29% (18)	(18%, 41%)
Total (100)	<b>16%* (16)</b>	(9%, 23%)	<b>24%* (24)</b>	(15%, 33%)
Other incidents 23% (113)				
Male (48)	2% (1)	(0%, 6%)	8% (4)	(0%, 16%)
Female (65)	6% (4)	(0%, 12%)	20% (13)	(10%, 30%)
Total (113)	4% (5)	(1%, 8%)	15% (17)	(8%, 22%)
Work-related injury 20% (100)				
Male (61)	3% (2)	(0%, 8%)	13% (8)	(4%, 22%)
Female (39)	5% (2)	(0%, 12%)	23% (9)	(10%, 37%)
Total (100)	4% (4)	(0%, 8%)	17% (17)	(9%, 25%)

# Indicates a significant difference based on mode of onset

a Indicates a significant difference between patients with history of motor vehicle accident compared to gradual onset.

Table 6. Prevalence of drug abuse and illicit drug use based on number of body regions involved

	One region 36% (180)			Two regions 48% (240)			Three regions 17% (80)		
	Male (95)	Female (85)	Total (180)	Male (82)	Female (158)	Total (240)	Male (28)	Female (52)	Total (80)
Opioid abuse	4% (4)	6% (5)	5% (9)	12% (10)	10% (16)	11% (26)	21% (6)	10% (5)	<b>14%* (11)</b>
95% CI	(0%,8%)	(1%,11%)	(2%,8%)	(5%,19%)	(5%,15%)	(7%,15%)	(6%,37%)	(1%,18%)	(6%,21%)
Illicit Drug Use	9% (9)	16% (14)	13% (23)	13% (11)	18% (28)	16% (39)	18% (5)	25% (13)	<b>22%* (18)</b>
95% CI	(3%,15%)	(8%,25%)	(8%,18%)	(6%,21%)	(12%,24%)	(11%,21%)	(3%,32%)	(13%,37%)	(13%,32%)

\* Indicates a significant difference between involvement of three regions compared to one region

Table 7. Prevalence of drug abuse and illicit drug use based on history of previous spine surgery

	History of previous spine surgery 35% (176)		
	Male (96)	Female (80)	Total (176)
Opioid abuse	10% (10)	6% (5)	8% (15)
95% CI	(4%,17%)	(1%,12%)	(4%,13%)
Illicit Drug Use	11% (11)	15% (12)	13% (23)
95% CI	(5%,18%)	(7%,23%)	(8%,18%)

Table 8. Prevalence of drug abuse and illicit drug use based on type of insurance

	Opioid Abuse		Illicit Drug Use	
	Patients	95% CI	Patients	95% CI
Third-Party 38% (192)				
Male (76)	10% (8)	(3%, 18%)	13% (10)	(5%, 21%)
Female (116)	16% (19)	(10%, 23%)	24% (28)	(16%, 32%)
Total	14% (27)	(9%, 19%)	20% (38)	(14%, 26%)
Medicare w/wo third-party 31% (154)				
Male (80)	11%* (9)	(4%, 18%)	5% (4)	(0%, 10%)
Female (74)	3% (2)	(0%, 6%)	7% (5)	(1%, 13%)
Total	7% (11)	(3%, 11%)	6%* (9)	(2%, 10%)
Medicare with Medicaid 17% (85)				
Male (28)	7% (2)	(0%, 17%)	25% (7)	(9%, 41%)
Female (57)	3% (2)	(0%, 8%)	19% (11)	(9%, 30%)
Total	5% (4)	(0%, 9%)	22% (18)	(12%, 30%)
Medicaid 14% (69)				
Male (21)	5% (1)	(0%, 14%)	19% (4)	(2%, 36%)
Female (48)	6% (3)	(0%, 13%)	23% (11)	(11%, 35%)
Total	6% (4)	(0%, 13%)	22% (15)	(14%, 36%)

Twenty-eight percent of present opioid abusers were also illicit drug users. In addition, 16% of current illicit drug users were also opioid abusers. On the other hand, there was no significant correlation between current opioid abuse and past history of illicit drug use (Table 11).

## DISCUSSION

Overall, opioid abuse was seen in 9% of patients and illicit drug use in 16% of patients. There were significant differences noted in the prevalence of opioid abuse in patients who developed chronic pain following motor vehicle accidents (16% vs 11% or 4%) and in patients with involvement in three regions of the body compared to one re-

gion (14% vs 5%). Illicit drug use was seen predominantly in patients below the age of 45, with no illicit drug use in patients 65 or older (25% vs 13% or 0%). Illicit drug use was also more prevalent in women less than 45 years of age compared to men (31% vs 15%).

There were differences noted based on the mode of onset of pain, with patients after motor vehicle injury showing a higher prevalence of illicit drug use compared to patients with gradual onset of pain (24% vs 12%). The number of body regions involved with pain problems also had significant relevance. Patients having involvement in three body regions showed a higher prevalence of illicit drug use compared to

those with involvement of one region (22% vs 13%). There was a significant correlation between a past history of illicit drug use or previous pain and current illicit drug use. However, insurance coverage and history of previous surgery had no correlation.

Our data illustrate that certain attributes correlate with drug abuse and illicit drug use: female patients less than 45 years of age; patients developing chronic pain after being involved in a motor vehicle injury; patients with multiple painful regions; and most importantly, patients with a past history of illicit drug use. Women were more likely to use marijuana than men. Various other factors such as duration of pain, history of workers compensation injury, insurance status or previous history of surgical intervention failed to correlate with drug abuse and illicit drug use.

This analysis identified additional features of chronic pain patients. First, chronic pain was common among younger women (<45 years of age) (42% vs 32%) and middle aged men (45 to 64 years of age) (59% vs 45%). Second, men had chronic pain longer than women (11.6 + 9.2 vs 10.1 + 7.5 years). Third, a greater proportion of women reported pain with gradual onset (44% vs 28%), whereas 30% of men compared to 13% of women suffered with chronic pain which started after a work-related injury. Fourth, a majority of patients had involvement of more than two regions of the body, with 54% of women complaining of pain in two regions, compared to 40% of men. Fifth, men underwent spine surgery more frequently than women (47% vs 27%), yet continued to suffer with pain. Sixth, more

patients were on Medicare (48%) and/or Medicaid (31%), compared to 38% on third-party insurance, while only 11% were over 65. Finally, 16% of patients admitted to using illicit drugs in the past.

Controlled substances can be diverted from their lawful purpose at any point in the pharmaceutical manufacturing and distribution process. Doctor shopping, illegal internet pharmacies, drug theft, prescription forgery and illicit prescriptions by physicians are some of the methods described for diversion of prescription drugs among adults. However, doctor shopping appears to be the most popular method of obtaining prescription drugs for illegal use. This is a major concern to physicians as the statistics presented by the National Center for Addiction and Substance Abuse at Columbia University (38) are startling. Based on current statistics, 15.1 million Americans have admitted to abusing prescription drugs – more than the combined number of those who admitted to abusing cocaine (5.9 million), hallucinogens (4 million), inhalants (2.1 million) and heroin (0.3 million). Further in a physician survey, there were three mechanisms of diversion perceived to be important. Overall, 96.4% of physicians surveyed believed that doctor shopping was the primary means by which patients inappropriately obtain controlled drugs. Approximately 88% of physicians surveyed believed that patient deception or manipulation of doctors was the second most common method, and 69% of surveyed physicians perceived that forged or altered prescriptions was the third most common method. Further, in the same survey, 59% of physicians believed that patients accounted for the bulk of the diversion problem and 47% said that patients commonly try to pressure them into prescribing a controlled drug. Unfortunately, only 40% of physicians admitted to receiving any training in medical school in identifying prescription drug abuse and addiction, whereas 43% admitted that they do not ask about prescription drug abuse when taking a pa-

**Table 9. Correlation between past history of illicit drug use and current illicit drug use**

	Current Illicit Drug Use		Total	
	Yes	No		
Past history	Yes	41	39	80
	No	39	381	420
	Total	80	420	500

Agreement = 84%\*  
51% of patients with past history of illicit drug use were also current illicit drug users.

**Table 10. Correlation between current opioid abuse and illicit drug use**

	Current Illicit Drug Use		Total	
	Yes	No		
Current Opioid Abuse	Yes	13	33	46
	No	67	387	454
	Total	80	420	500

Agreement = 78%\*  
28% of patients abusing opioids were also illicit drug users  
16% of patients using illicit drugs were also abusing opioids

**Table 11. Correction between current opioid abuse and past history of illicit drug use**

	Past history of Illicit drug use		Total	
	Yes	No		
Opioid abuse	Yes	17	29	46
	No	63	391	454
	Total	80	420	500

Agreement = 82%\*  
37% of patients abusing opioids are also past history of illicit drug users  
21% of patients with past history of illicit drugs use were currently abusing opioids

tient's health history, and 33% admitted that they do not regularly call or obtain records from a patient's previous physician before prescribing controlled substances on a long-term basis. Similarly, a survey of pharmacists revealed that 52% of pharmacists believe that patients account for the bulk of the diversion problem. Only few prescription monitoring programs are physician friendly in obtaining a patient drug profile. The issue of physician access to appropriate patient data may be resolved once NASPER is enacted in all states.

Among all illicit drugs used in the United States, marijuana is the most widely used and readily available illicit drug. The 2004 NSDUH survey (3) showed that marijuana was the most

commonly used illicit drug in 2004, with a prevalence of 6.1% or 14.6 million current users. The average age at first use among 2.1 million recent marijuana initiates was 18 years (3). Indeed, 64% of recent initiates were younger than 18 years when they first tried the drug. Numerous reasons suggested for widespread use of marijuana include a relaxed public attitude regarding its potential harm, popularization by the media, the current trend of smoking marijuana-filled cigars known as "blunts", widespread use of the internet, and increase in popularity of advocacy groups for legalization of marijuana (39). Consequently, deleterious effects of marijuana are not well appreciated, despite its use over several decades (40, 41), in-

cluding impaired educational attainment (40), impaired work place productivity (42) and as a gateway to illicit drug use and an increased risk of use of other mood enhancing substances (43). In addition, marijuana may play a major role in motor vehicle accidents (44) and cause adverse effects on cardiovascular and respiratory systems (45, 46). While marijuana produces feelings of relaxation and well-being, it impairs cognitive function and performance of psychomotor tasks (47), while overdose can induce panic attacks and psychosis (48). Symptoms of withdrawal include restlessness, irritability, and insomnia (49). Marijuana was the most commonly used illicit drug in the present study, in agreement with multiple previous reports. Marijuana use was more prevalent among Medicaid patients and women.

Next to marijuana, cocaine is the most commonly used illicit drug in the United States. The 2004 NSUDH survey (3) showed current cocaine users as 2.0 million and approximately 1.0 million persons had used cocaine for the first time within the past 12 months – approximately 2,700 new users per day. Pharmacologically, cocaine is an important blocker of dopamine- norepinephrine and serotonin-uptake transporters (47), besides being a powerful addictive agent (50). Cocaine-related deaths are often a result of cardiac arrest or seizures followed by respiratory arrest (50). Mixing alcohol and cocaine increases the rate of sudden death. Cocaine was the second most commonly used illicit drug in this study.

Next to marijuana and cocaine are drugs described as “poor man’s cocaine”; crystal meth, ice, glass, etc. – namely amphetamine and methamphetamine. Pharmacologically, short-term administration of amphetamine and methamphetamine produces euphoria, a feeling of well-being and increased alertness, arousal, concentration and motor activity. In contrast, long-term use causes paranoid like psychosis with aggressive and stereotyped behavior in addition to irritability (47). Amphetamine use was

detected in 1% to 3% of patients in the present study.

Multiple issues may be raised regarding methodology; definitions of opioid abuse, doctor shopping and trafficking; non-inclusion of other drugs; non-participation by 66 of 566 consecutive patients; and rapid drug screening. First, sampling methodology was appropriate for the type of evaluation. Randomization is not expected to provide further validity. In fact, randomization in chronic pain patient population was inferior in identification of variations among groups (51). Second, definitions of opioid abuse, doctor shopping and trafficking are not uniform and well accepted. We have used abuse and doctor shopping definitions consistently in all studies (9-11, 14, 15, 23). Trafficking was defined by legal decision. Third, we have not studied if patients were taking controlled substances as prescribed or not. In this study, we also have not included the evaluation of illicit opioid use by drug testing. Further, multitude of other drugs, including alcohol were not studied. Fourth, some may consider all 66 patients refusing to participate in the study were opioid abusers and illicit drug users. Non-participation of 66 of 566 patients (12%) is well within acceptable limits. Majority of these patients had no history of abuse of opioids or illicit drug use with similar characteristics as the sample. While, they refused to participate in the study, they did not refuse to follow controlled substance agreement, except for 2 of 66 patients. Finally, type of drug screening is appropriate, rapid drug screening utilizing enzyme immunoassay has been shown to be valid. It is a reliable screening tool for multiple drugs, rapidly and inexpensively. A side-by-side comparison of rapid drug testing with GC/MS yielded over 90% correlation. Agreement with GC/MS was 91% for THC, 93% for cocaine, over 96% for methadone, over 95% for opioids, 96% for amphetamines and methamphetamine, and 99% for barbiturates. Thus, we assume that the results are reasonably accurate. However, we advise that physi-

cians should exercise caution if the patient is denied future treatment based on these results. In such cases, results should be accurately confirmed with laboratory testing utilizing GC/MS.

The relationship between the past history of illicit drug use and current illicit drug use, as well as current opioid abuse needs further discussion. Past history of illicit drug use was obtained by patients’ own admission. It is assumed that this will underestimate actual past illicit drug use. As illustrated in Table 9, 51% of patients with a past history of illicit drug use were also current illicit drug users. This indicates that not all admitted past illicit drug users will turn out to be current illicit drug users. Practitioners must be careful in managing these patients as admission to past illicit drug use should not be a deterrent to providing appropriate therapy with opioids.

The correlation between current opioid abuse and a past history of illicit drug use was weak, as demonstrated in Table 11. In contrast to 51% of past illicit drug users currently using illicit drugs, 37% of patients currently abusing opioids also had a past history of illicit drug use. Further, only 21% of patients with past history of illicit drug use were also currently abusing opioids. Thus, a past history of illicit drug use may lead to increased suspicion, which may be unfounded. In addition, correlation also was weak between current opioid abuse and illicit drug use. Only 28% of current abusers of opioids were also illicit drug users. Correlation was even less when compared to current illicit drug users who were also current opioid abusers, with 16% of them using illicit drugs and currently abusing opioids. In a comparative evaluation of illicit drug use in patients with or without controlled substance abuse in interventional pain management (26), the prevalence of illicit drug use in patients without a history of controlled substance abuse was 14%. In contrast, illicit drug abuse in patients with a history of controlled substance abuse was 34%. In the present study, 28% of cur-



rent opioid abusers were also using illicit drugs. While the correlation appeared weak, the results of the present study are also similar to the previous report (28% versus 34%) (26). Similar to these results, it was shown (17) that among patients with abnormal urine drug screens with chronic non-malignant pain treated with opioids, 46% were using illicit drugs. Indeed, multiple evaluation tools have been proposed in the past to identify predictors of aberrant drug-related behavior and addiction in patients being treated with controlled substances for pain (12, 13, 52-61).

A controlled substance abuse screening tool was evaluated for appropriateness to identify illicit drug use (61). The same tool (55) showed significant correlations in identifying opioid abuse. However, in a comparative evaluation, this tool (with four items: excessive opiate needs, deception or lying to obtain controlled substances, current or prior intentional doctor shopping, and current or prior use of illicit drugs and denial) failed to identify current illicit drug use. However, the tool even was helpful in identifying current drug abuse (61). Thus, it appears that history of a past illicit drug use is an important indicator of current opioid abuse and illicit drug use, though it will not substitute vigilance and adherence monitoring. In fact, this is line with non-medical use of pain relievers (3). NSDUH Survey of 2004 identified previous illicit use of marijuana, cocaine, stimulants, tranquilizers, and/or hallucinogens as a risk factor for non-medical use of pain relievers. Even then, these patients also should be treated carefully rather than being discharged. If required, they may be referred to addiction management.

The stereotyping of Medicaid patients being highest opioid abusers and illicit drug users (also demonstrated in the past) was not confirmed in this analysis. More common abuse and illicit drug use in patients with involvement of multiple body regions and also in patients developing pain after a motor vehicle accident are important variables to be kept in mind. However, once again,

these are not foolproof indicators and physicians while cautious, must treat the patients appropriately. If required, addiction management may be provided. An increased prevalence of current opioid abuse and illicit drug use in patients developing pain after motor vehicle injuries correlates with previous reports that marijuana may play a major role in motor vehicle accidents (44). Increased abuse patterns in patients with multiple painful body regions may also be explained by the fact that increased level of pain with generalized involvement may succumb patients to use illicit drugs and also doctor shop in search of better relief. Illicit drug use was more as expected in younger age group of less than 45 years of age. This finding is similar to the analysis of 2003 NSDUH Survey, indicating younger age (18-25) as a risk factor for abuse (3). It was also not surprising that females used illicit drugs more commonly than males, as NSDUH Survey (3) showed that over half (54.9%) of the persons who initiated non-medical use of pain relievers were female in 2003. These results only indicate that a physician cannot use stereotyping.

#### CONCLUSION

Opioid abuse and illicit drug use were seen in 9% and 16% of patients, though, less commonly than previously reported. Illicit drug use was more common in patients with less than 45 years of age, in patients developing pain after motor vehicle accident and patients with involvement of three regions of the body. Correlation between previous history of illicit drug use with current illicit drug use was strong.

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