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## Clinician Beliefs and Attitudes about Buprenorphine/Naloxone Diversion

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### Abstract

**Background and Objectives**—Concern about diversion of buprenorphine/naloxone (B/N) in the U.S. may affect prescribing patterns and policy decisions. This study examines addiction treatment clinician beliefs and attitudes regarding B/N diversion.

**Methods**—Participants (n=369) completed a 34-item survey in 2010 during two national symposia on opioid dependence. We conducted multivariable regression, examining the relationship of perceived danger from B/N diversion with clinician characteristics and their beliefs about B/N treatment and diversion. We compared causal beliefs about diversion among clinicians with and without B/N treatment experience.

**Results**—Forty percent of clinicians believed that B/N diversion is a dangerous problem. The belief that *B/N diversion increases accidental overdoses in the community* was strongly associated with perceived danger from B/N diversion.

**Conclusions and Scientific Significance**—Attitudes and beliefs, not education level, were associated with clinician's perceived danger from B/N diversion. Clinicians with greater B/N patient experience were more likely to believe treatment access barriers are the major cause of B/N diversion.

## 1. BACKGROUND AND OBJECTIVES

Over the past decade, introduction of outpatient buprenorphine/naloxone (B/N) treatment for opioid dependence has been implemented cautiously in the United States. Multiple modes of regulation have been implemented, including the Drug Enforcement Agency (DEA) requiring prescribers to complete formal B/N education; inclusion in prescriber registry; DEA auditing of physician practices and adverse events; and a first-year 30-patient limit. B/N has proven safe and effective for opioid detoxification<sup>1</sup> and outpatient maintenance<sup>2</sup> with B/N diversion being an unintended adverse consequence of increased B/N prescribing.

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### Declaration of Interest:

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

Since 2006, U.S. emergency department visits due to non-medical use of buprenorphine have tripled from 4,440 to 14,266<sup>3</sup>. Epidemiologic reports of fatal overdoses among individuals mixing buprenorphine with sedatives<sup>4-6</sup> and increased risk of accidental ingestion of B/N among young children<sup>7</sup> have contributed to increased regulatory concern about B/N diversion. Because diversion is an illegal, hidden activity, systematic investigation of cause and effects can be methodologically challenging and attainable evidence is usually in the form of indirect measures (police seizures, emergency department visits) or self-report. Therefore, gathering evidence from stakeholders with various perspectives can help identify common areas of concern. In this context, a nationally representative U.S. sample of addiction treatment clinicians provides an essential window into causes and effects of B/N diversion.

Indeed, the level of concern among addiction treatment professionals about B/N diversion has never been assessed, and little is understood about underlying factors that influence their concern. Clinicians with experience working in programs that treat people prescribed B/N may offer a unique, important perspective on the causes of B/N diversion. Clinician beliefs and attitudes toward buprenorphine treatment services have had a substantial impact on prescribing practices and treatment access<sup>8-10</sup>. Historically, perceived danger from diversion of opioid agonist treatment has resulted in increased regulations for opioid treatment providers<sup>11</sup>; therefore, clarification of clinician concern and causal beliefs about B/N diversion could influence the national regulatory response. Our primary aim was to assess the level of concern among addiction treatment clinicians about the dangerousness of the problem of B/N diversion and to test the hypothesis that such perceived danger would be associated with specific attitudes and beliefs about B/N treatment rather than by B/N treatment experience, formal B/N education, or level of professional training. Our secondary aim was to test the hypothesis that clinicians who have experience working with patients prescribed B/N will differ in their level of agreement with certain causal beliefs about B/N diversion, compared to clinicians without B/N experience.

## 2. METHODS

### 2.1. Study design and setting

This study was approved by the McLean Hospital Institutional Review Board. To achieve a geographically diverse, national sample, with a balance of physician prescribers and non-prescribing clinicians, we conducted a cross-sectional, voluntary, self-report survey without incentive in two convenience samples of addiction treatment clinicians attending national conferences on substance use disorders. The 34-item paper-and-pencil survey was completed immediately prior to opioid-related conference symposia in 2010: a symposium at Cape Cod Symposium on Addictive Disorders (CCSAD) in Hyannis, MA, largely attended by a national representation of non-prescribing addiction treatment professionals, and an American Academy of Addiction Psychiatry (AAAP) symposium in Boca Raton, FL, attended by a national representation of physician prescribers. Survey distribution was approved by conference organizers and AAAP Board of Directors.

### 2.2. Participants

Response rates were 72% (N=195/271) from CCSAD and 87% (N=174/201) from AAAP. Surveys missing >25% of data were excluded, resulting in 339 participants analyzed: 174 CCSAD and 165 AAAP participants.

### 2.3. Measure

We developed a one-page, 34-item self-report survey with 27 core items assessing clinician beliefs about B/N, preceded by clinician demographics and followed by B/N clinical

experience characteristics. We assessed three domains: 1) beliefs about B/N treatment, 2) attitudes about addiction treatment and recovery, and 3) beliefs about causes of B/N diversion. A primary dependent variable “*B/N diversion is a dangerous problem*” was embedded within the survey to capture the construct of perceived danger from the problem of B/N diversion. All belief items were dispersed rather than clustered by topic. Within the 5-point Likert scale, participants were instructed to circle a number best representing their level of agreement with each item.

Clinician belief items were generated based on three main hypotheses: 1) clinicians who believe diverted B/N is used for self-treatment, and not to get high, would perceive less danger, 2) clinicians who do not believe B/N treatment is a valid form of addiction recovery or who are not B/N prescribers would perceive more danger, and 3) perceived danger from illicit B/N trafficking may be caused by misattribution with related constructs (e.g., pediatric accidental ingestion) or general beliefs communicated by community media that have yet to be fully supported by an empirical evidence base (e.g., B/N diversion increases accidental overdoses in the community). After review by 4 clinical B/N treatment experts, the survey was pilot-tested with 10 clinicians at McLean Hospital.

## 2.4. Statistical methods

Data were reviewed for outliers and missing items. Due to little variation (90% Caucasian), race was excluded from analysis. For bivariate analyses, independent t-tests and chi-square tests were used with continuous and categorical dependent variables, respectively. A multivariable linear regression model was designed to identify variables associated with perceived danger from B/N diversion: 4 parallel models examined demographic characteristics (M1), addiction treatment characteristics (including addiction treatment experience, professional training, and formal B/N education) (M2), attitudes and beliefs about B/N treatment and recovery (M3), and beliefs about causes of B/N diversion (M4). Items with a p-value <0.10 in any model were included in the final model. Multicollinearity was assessed by examination of tolerance (cutoff < 0.1) and variance inflation factors (cutoff >10.0); variables didn't exceed acceptable limits. Post-hoc correlation analyses were conducted. Data analysis used SPSS 17.

## 3. RESULTS

### 3.1. Sample description

Study participants (n=339) from 34 U.S. states were included (Table 1). About half were female; most were white, with median age=53, ranging from 23 to 79 years. About half were physicians; overall, participants had considerable experience in addiction treatment (median=15 years, range: <1–50 years) and were likely to have worked in programs that treat patients prescribed B/N (n= 259, 76%). Most had formal B/N education (n=208, 61%) as well as experience working with patients prescribed B/N (median=8.4 patients/week, range: <1–100/week), whereas fewer than half (40.1%) were outpatient B/N prescribers. Given differences in the two recruitment sources on most of these background characteristics, regression models were adjusted for this variable.

### 3.2. Perceived danger from B/N diversion

The median response by clinicians was neutral, neither agreeing nor disagreeing with “*B/N diversion is a dangerous problem*”; mean=3.2±1.2 on a 5-point Likert scale, and 40% (n=135) either agreed or strongly agreed.

The final model, which accounted for 48.6% of the variance in perceived danger associated with B/N diversion, was driven by beliefs about B/N (Table 2). In this model, the items most

strongly associated with perceived danger from B/N diversion were 1) *B/N diversion increases accidental overdoses in the community* ( $B=0.32$ ); 2) *B/N diversion is illegal, so it should be prevented* ( $B=0.20$ ); 3) *B/N diversion threatens child safety* ( $B=0.15$ ); and 4) *diverted B/N is used by people with opioid dependence to get high* ( $B=0.12$ ). Other beliefs associated with perceived danger included *clients with chronic pain use diverted B/N to achieve higher doses* ( $B=0.11$ ); *diversion is caused by clients with a B/N prescription selling it for money* ( $B=0.11$ ); and *B/N diversion worsens the opioid epidemic* ( $B=0.09$ ). Seven of 14 variables that were significant in individual models were no longer significant ( $p<0.05$ ) in the final model.

No variables in the final model were associated with less perceived danger; however, several items represented trends in the final model ( $p<0.1$ ) and were significant in individual models. For example, male gender (M1), outpatient B/N prescribers (M2), and believing *diversion is caused by patients with a B/N prescription sharing with peers who cannot find treatment* (M4) were all factors associated with less perceived danger.

### 3.3. Experience and causal beliefs about B/N diversion

Clinicians with experience in programs that treat patients prescribed B/N were 60% more likely than clinicians without this experience to attribute diversion to limited access to treatment (Table 3). While five different causal beliefs were endorsed by more than 50% of clinicians, comparatively few clinicians endorsed the major causes of B/N diversion as *doctors' profiting from prescribing B/N irresponsibly* (19.9%) or *people with B/N prescriptions giving it to others who want to get high* (26.8%).

### 3.4. Beliefs about B/N diversion

Some beliefs about B/N were held more commonly than others (Table 4). Nearly 80% believed that legal B/N helps people with opioid dependence engage in recovery, while less than 30% believed that B/N diversion increases accidental overdoses or worsens the opioid epidemic. Nearly two-thirds believed diverted B/N is used to prevent withdrawal or used when people can't get their drug of choice.

### 3.5. Belief about accidental overdoses

We conducted post-hoc analyses examining correlates of the belief that *B/N diversion increases accidental overdoses in the community*. We found moderate correlations with *illicit B/N is used by people with opioid dependence to get high* ( $r=0.45$ ,  $p<0.001$ ) and *B/N diversion discourages professional help-seeking* ( $r=0.45$ ,  $p<0.001$ ). The only items that correlated negatively with *B/N diversion increases accidental overdoses in the community* were weak associations with *illicit B/N is used for preventing withdrawal* ( $r=-0.16$ ,  $p<0.01$ ) and *legal B/N helps people engage in a recovery program* ( $r=-0.19$ ,  $p<0.01$ ).

## 4. CONCLUSIONS AND SCIENTIFIC SIGNIFICANCE

This study conducted in two independent national samples with high response rates among both physicians and non-physicians demonstrates that, despite growing epidemiologic evidence of B/N diversion, only 40% of clinicians agree that diversion of B/N is a dangerous problem.

### 4.1. Examining perceived danger

Training, education, and experience variables were not associated with perceived danger except for outpatient B/N prescribers, who were less likely to perceive B/N diversion as a dangerous problem. However, when adjusted for beliefs and attitudes, it was no longer significant, suggesting that prescribing B/N has an indirect effect on perceived danger.

As hypothesized, one variable associated with perceived danger from B/N diversion was the belief that *diverted B/N is used by people with opioid dependence to get high*. Buprenorphine misuse patterns are highly dependent on national characteristics, because of differences in delivery method, culture, and regulatory environment<sup>12</sup>. While use of diverted B/N by opioid-naïve and non-injection users may be more likely to represent attempts to attain euphoria<sup>13</sup>, both epidemiologic<sup>14</sup> and physiologic evidence<sup>15,16</sup> suggest that injection heroin users are less likely to use it for that purpose. Illicit use for euphoria has decreased among opioid dependent treatment-seekers in the US<sup>17,18</sup>, and several recent studies suggest that the primary reason for illicit B/N use among treatment seekers is to prevent withdrawal<sup>15, 19</sup> or provide self-treatment when legal treatment is unavailable<sup>13,18–20</sup>. Given this discrepancy between treatment-seekers and those without interest in treatment, clinicians who work mainly with treatment-seekers may have a one-sided view of illicit B/N usage patterns.

The belief that *B/N diversion increases accidental overdoses in the community* was the variable most strongly associated with perceived danger from B/N diversion. However, no evidence yet exists to support the belief that diversion of B/N increases overall likelihood of community accidental opioid overdoses. If non-treatment-seeking persons with lower opioid tolerance misuse B/N or mix diverted B/N with sedatives, then B/N diversion could potentially increase overdoses. In contrast, epidemiologic evidence demonstrates increased B/N treatment access reduces opioid-related mortality; people switch from full agonists to B/N<sup>21</sup>, which has a protective “ceiling effect” for respiratory depression<sup>22</sup>. Compared with full agonists, B/N is less frequently used for euphoria<sup>17</sup> and non-medical use has been less likely to require emergency medical attention<sup>23,24</sup>. Therefore, decreasing B/N access could increase frequency of accidental overdoses among the opioid-dependent. Interestingly, if use of illicit B/N occurs mainly a) among opioid-dependent treatment-seekers, with history of injection heroin use or with substantial physiologic dependence, and b) because of inadequate access to treatment or withdrawal prevention<sup>18</sup>, then diversion may ironically decrease community opioid overdoses.

As hypothesized, concern about child safety was associated with perceived danger from B/N diversion. Accidental pediatric sublingual B/N ingestion more commonly results in morbidity when compared to other opioids<sup>7,25–28</sup>. However, the perceived fear from B/N diversion likely represents a misattribution, as most reported pediatric B/N exposures are associated with caretakers having licit B/N prescriptions and neglecting to secure their medication, not deliberate B/N diversion<sup>7</sup>. However, opioid-naïve adolescents can experience euphoria from B/N<sup>29,30</sup>, and they may perceive illicit B/N to be safer than other drugs. Notably, friends and/or family with legitimate prescriptions are the most commonly reported sources of illicit opioids used by adolescents<sup>31</sup>. The evidence in both cases reinforces the importance of secure storage of B/N among people living with children and adolescents.

#### 4.2. Beliefs about causes of diversion

Clinical experience working with patients prescribed B/N may influence beliefs about B/N diversion. Our results show clinicians experienced working in programs with patients prescribed B/N were more likely than inexperienced clinicians to believe that poor access to local, affordable treatment is the main cause of B/N diversion. Previous research demonstrated self-reported use of illicit B/N decreased when opioid-dependent individuals gained access to a B/N treatment program<sup>18</sup>. Notably, in the causal model (M4), the belief that *B/N is diverted for sharing with peers without access to legal prescriptions* is associated with decreased perceived danger from B/N diversion. This belief is the most commonly held causal belief among clinicians with B/N experience. While the waiver course and

Physician's Clinical Support System for Buprenorphine (PCSS-B) address the issue of access to affordable B/N treatment, this represents an area for further targeted education.

#### 4.3. Limitations

Using conference symposia on topics related to opioid dependence treatment to distribute surveys and enroll volunteers may have caused a selection bias, leading to inclusion of professionals more interested in opioid dependence treatment. Additionally, attitudes about B/N treatment access may influence who has chosen to work in programs with B/N patients, so self-selection bias could also impact the finding that those with B/N experience believe lack of access to B/N treatment is the strongest driver of diversion. Importantly, clinicians with B/N experience have familiarity working with treatment-seeking opioid-dependent patients, not active illicit opioid users or opioid-naïve abusers who often have different patterns of illicit B/N use<sup>13</sup>.

While the survey items were not validated, we conducted pilot testing to eliminate most problematic features before data collection. Nevertheless, some concern arose that survey items were not defined clearly enough, allowing for possible misinterpretations (e.g., relationship of B/N diversion to *accidental overdoses*, type of danger referred to by *dangerous problem*). The lack of formal validation of these items is a study limitation.

This study did not differentiate between waiver-education for physicians and possible other forms of non-specific "formal B/N education" for non-physicians. Future research could explore how types of education (mandatory opioid prescriber education, fellowship training, and B/N diversion prevention seminars) affect beliefs.

Finally, this study does not address development of B/N film with child-proof, numeric-identified packaging<sup>32</sup> or buprenorphine implant<sup>33</sup>, which represent attempts to reduce unintended adverse events.

#### 4.4. Summary

Attitudes and beliefs, not education level, were associated with clinicians' perceptions of danger from B/N diversion. Clinicians with greater B/N patient experience were more likely to believe treatment access barriers are the major cause of B/N diversion.

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**Table 1**

Sample description (n=339)

<b>Background characteristics</b>	<b>CCSAD (n=174)</b>	<b>AAAP (n=165)</b>
<i>Demographics</i>		
Age (mean, sd) **	55.2, 9.5	48.3, 11.0
Female, % *	53.8	37.9
<i>Professional experience</i>		
Physician, % **	10.9	87.3
Years in addiction treatment (mean, sd) *	17.5, 10.0	14.6, 10.1
Program has B/N clients, % yes **	73.2	93.6
B/N education, % yes **	40.4	87.2
Outpatient B/N prescriber, % yes **	10.8	70.4
B/N clients/week (mean, sd)	7.3, 16.6	9.5, 13.2

\*  
p<.01;\*\*  
p<.001

CCSAD= Cape Cod Symposium for Addictive Disorders

AAAP= American Academy of Addiction Psychiatry

B/N= Buprenorphine/Naloxone

Table 2

Predictors of perceived danger from Buprenorphine/Naloxone diversion among addiction treatment clinicians (n=339)<sup>†</sup>

Predictor variables	Model 1	Model 2	Model 3	Model 4	Final Model
<b>Demographics</b>					
Female gender	0.161 <sup>**</sup>				0.073 <sup>^</sup>
Age	0.048				
<b>Addiction Treatment Experience &amp; Training</b>					
Outpatient B/N prescriber		-0.176 <sup>*</sup>			-0.034
Formal B/N training		-0.102			
Program works with people prescribed B/N		0.069			
Physician		-0.065			
Years working with substance use disorders		-0.056			
Number per week of people prescribed B/N		-0.054			
Recruitment source (CCSAD or AAAP)		0.027			
<b>Beliefs about B/N Treatment</b>					
B/N diversion increases accidental opioid overdoses			0.297 <sup>***</sup>		0.315 <sup>***</sup>
B/N diversion threatens child safety			0.138 <sup>**</sup>		0.151 <sup>***</sup>
Diverted B/N used by opioid dependent to get high			0.117 <sup>*</sup>		0.121 <sup>*</sup>
Chronic pain patients use B/N for higher doses			0.126 <sup>**</sup>		0.110 <sup>*</sup>
B/N diversion worsens opioid epidemic			0.121 <sup>*</sup>		0.094 <sup>*</sup>
Addicts use diverted B/N to sample it			-0.097 <sup>*</sup>		-0.065
B/N diversion discourages seeking professional help			0.069		
Diverted B/N used for self-treatment			0.069		
Diverted B/N used to prevent withdrawal			-0.053		
Diverted B/N used if can't get drug of choice			0.046		
Legal rx B/N helps clients engage in recovery			-0.036		
Diverted B/N used because cheaper than treatment			-0.030		
Most addicts have tried B/N before treatment			-0.016		
<b>Attitudes about Treatment and Recovery</b>					

Predictor variables	Model 1	Model 2	Model 3	Model 4	Final Model
B/N diversion is illegal so it should be prevented			0.196***		0.202***
Primary goal is to encourage clients to work the 12 steps			0.074 <sup>^</sup>		0.069
Adolescents should not be offered B/N maintenance			0.086 <sup>^</sup>		0.059
B/N maintenance is not real recovery			-0.073		
Clients need to fail detox before B/N maintenance			0.016		
<b>Beliefs about Causes of B/N Diversion</b>					
Clients with a B/N prescription often sell it for money				0.238	0.114*
Clients share rx with peers who can't find treatment				-0.129	-0.086 <sup>^</sup>
Clients with a B/N rx give it to others to get high				0.224	-0.033
Doctors profiting from prescribing B/N irresponsibly				0.065	
Many clients believe self-treatment is effective				-0.052	
Poor insurance coverage of B/N treatment services				0.050	
Lack of access to affordable B/N treatment				-0.021	
<b>Adjusted R<sup>2</sup></b>	0.021*	0.057***	0.476***	0.126***	0.486***

<sup>^</sup> Coefficients are standardized betas.

<sup>^</sup> p<0.10

\* p<0.05

\*\* p<0.01

\*\*\* p<0.001

**Table 3**

B/N Clinical Experience and Beliefs about Causes of Buprenorphine Naloxone Diversion (n=307)

Beliefs about causes of B/N diversion (% agree or strongly agree)	Experience having patients prescribed B/N in your program		
	Yes (n=257)	No (n=50)	<sup>2</sup>
Clients with a B/N rx share it with peers who can't find treatment	61.6%	37.3%	10.28 <sup>**</sup>
Lack of access to local affordable B/N treatment	56.3	36.0	6.89 <sup>*</sup>
Clients with a B/N rx often sell it for money	51.2	46.9	0.30
Poor insurance coverage of B/N treatment services	49.6	50.0	<0.01
Many clients believe self-treatment is effective	50.0	46.0	0.27
Clients with a B/N rx give it to others who want to get high	25.4	34.0	1.58
Doctors profiting from prescribing B/N irresponsibly	20.2	18.0	0.13

\*  
p 0.01,\*\*  
p 0.001

B/N= Buprenorphine/Naloxone

**Table 4****Clinician Beliefs about Buprenorphine/Naloxone Treatment and Causes of Diversion (n=339)**

<b>Beliefs about B/N Treatment and Recovery</b>	<b>(% agree or strongly agree)</b>
Legally prescribed B/N helps clients engage in recovery	79.9
Diverted B/N is used if opioid users can't get drug of choice	67.1
Diverted B/N is used to prevent withdrawal	64.9
B/N diversion is illegal so it should be prevented	64.5
B/N diversion is a concerning problem	62.5
Diverted B/N is used for self-treatment of opioid dependence	59.5
B/N diversion is a dangerous problem	40.4
B/N diversion threatens child safety	38.9
Addicts use diverted B/N to sample it	35.0
Diverted B/N is used by people with opioid dependence to get high	34.8
My primary treatment goal is to encourage clients to work the 12 steps	30.9
B/N diversion discourages opioid addicts from seeking professional help	30.5
Most addicts have tried B/N before treatment	29.2
Diverted B/N is used because it is cheaper than treatment	28.3
B/N diversion increases accidental opioid overdoses in the community	26.8
Adolescents should not be offered B/N maintenance	25.0
B/N diversion worsens the opioid epidemic	20.8
Chronic pain patients use B/N for higher doses	20.5
Clients need to fail detox before being considered for B/N maintenance	15.1
B/N maintenance is not real recovery	15.0
<hr/>	
<b>Beliefs about the Major Causes of B/N Diversion</b>	<b>(% agree or strongly agree)</b>
Clients with a B/N rx share it with peers who can't find treatment	55.4
Lack of access to local affordable B/N treatment	53.9
Poor insurance coverage of B/N treatment services	51.0
Clients with a B/N rx often sell it for money	49.5
Many clients believe self-treatment is effective	48.6
Clients with a B/N rx give it to others who want to get high	27.2
Doctors profiting from prescribing B/N irresponsibly	20.8

B/N= Buprenorphine/Naloxone