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Mechanisms of Prescription Drug Diversion Among Drug-Involved Club- and Street-Based Populations

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Abstract

Objective—Prescription drug diversion involves the unlawful channeling of regulated pharmaceuticals from legal sources to the illicit marketplace, and can occur along all points in the drug delivery process, from the original manufacturing site to the wholesale distributor, the physician's office, the retail pharmacy, or the patient. However, empirical data on diversion are limited.

Method—In an attempt to develop a better understanding of how specific drug-using populations are diverting prescription opioids and other medications, or obtaining controlled drugs that have already been diverted, qualitative interviews and focus group data were collected on four separate populations of prescription drug abusers in Miami, Florida—club drug users, street-based illicit drug users, methadone maintenance patients, and HIV positive individuals who abuse and/or divert drugs.

Results—Sources of abused prescription drugs cited by focus group participants were extremely diverse, including their physicians and pharmacists; parents and relatives; “doctor shopping”; leftover supplies following an illness or injury; personal visits to Mexico, South America and the Caribbean; prescriptions intended for the treatment of mental illness; direct sales on the street and in nightclubs; pharmacy and hospital theft; through friends or acquaintances; under-the-door apartment flyers advertising telephone numbers to call; and “stealing from grandma's medicine cabinet.”

Conclusion—While doctor shoppers, physicians and the Internet receive much of the attention regarding diversion, the data reported in this paper suggest that there are numerous active street markets involving patients, Medicaid recipients and pharmacies as well. In addition, there are other data which suggest that the contributions of residential burglaries, pharmacy robberies and thefts, and “sneak thefts” to the diversion problem may be understated.

Keywords

Prescription Drug Abuse; Prescription Drug Diversion; Opioids; Pain Medication

Introduction

Prescription drug “diversion,” defined as the unlawful channeling of regulated pharmaceuticals from legal sources to the illicit marketplace [1], has been a topic of widespread commentary

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since the latter part of the 1990s [2–7]. The Drug Enforcement Administration (DEA) has estimated that prescription drug diversion is a \$25 billion-a-year industry [8,9], and that diversion can occur along all points in the drug delivery process, from the original manufacturing site to the wholesale distributor, the physician's office, the retail pharmacy, or the patient [10].

Diversion can occur in many ways, including: the illegal sale of prescriptions by physicians and those who are referred to on the street as “loose” pharmacists; “doctor shopping” by individuals who visit numerous physicians to obtain multiple prescriptions; theft, forgery, or alteration of prescriptions by health care workers and patients; robberies and thefts from manufacturers, distributors, and pharmacies; and thefts of institutional drug supplies [11–13]. Furthermore, there is growing evidence that the diversion of significant amounts of prescription opioids and benzodiazepines occurs through residential burglaries as well as cross-border smuggling at both retail and wholesale levels [1,14–17]. In addition, recent research has documented diversion through such other channels as: “shorting” (undercounting) and pilferage by pharmacists and pharmacy employees; recycling of medications by pharmacists and pharmacy employees; medicine cabinet thefts by cleaning and repair personnel in residential settings; theft of guests' medications by hotel repair and housekeeping staff; and Medicare, Medicaid, and other insurance fraud by patients, pharmacists, and street dealers [1,15,18,19]. Moreover, it would appear that pill-abusing middle- and high-school students are obtaining their drugs through medicine cabinet thefts, medication trading at school, and thefts and robberies of medications from other students. Finally, a number of observers consider the Internet to be a significant source for illegal purchases of prescription drugs [20,21].

Although national surveys and monitoring systems have been documenting widespread abuse of prescription drugs, and numerous scientific articles over the years have discussed the problems associated with diversion [1,7,22–28], empirical data on the scope and magnitude of diversion, as well as on patterns of diversion associated with specific drugs of abuse, different user populations, and/or other demographic, sociocultural, and psychosocial factors, are largely unavailable and remain absent from the literature. In fact, at a recent meeting sponsored by the College on Problems of Drug Dependence focusing on the “Impact of Drug Formulation on Abuse Liability, Safety, and Regulatory Decisions,” representatives from government regulatory agencies, the pharmaceutical industry, and the research community agreed that: 1) there are no data on the magnitude of particular types of diversion; 2) there are no systematic data on how the massive quantities of abused prescription drugs are reaching the streets; and 3) there are no empirical data that might be used for making regulatory decisions and for developing prescription drug prevention and risk management plans [18,19,21,29–34].

Diversion can be described as a disorganized, for-profit industry. It is referred to here as “disorganized” because there are so many different players involved in the phenomenon, including: physicians, pharmacists, and other health care professionals; drug abusers, patients, students, street dealers, and white-collar criminals; and tourists, saloonkeepers, and all types of service personnel to name but a few. The range of diversion is so broad, furthermore, that answers as to what the major sources of diversion are really depend on who is asked. Federal agencies maintain that diverted drugs enter the illegal market primarily through “doctor shoppers,” inappropriate prescribing practices by physicians, and improper dispensing by pharmacists. Internet sales have also been identified as the major source of diversion by federal authorities [20,35]. By contrast, as a adjunct to a postmarketing surveillance program to monitor the diversion and abuse of oxycodone and a variety of other prescription opioids [36], in 2005 the authors surveyed diversion investigators in 300 police and regulatory agencies participating in this nationwide surveillance program. The responses of these survey participants reflected a wider assortment of diversion mechanisms [37]. For example, as illustrated in Figure 1, although almost three-fourths of the survey participants considered drug

abusers posing as patients as the major source of diversion (through doctor shopping and prescription theft/forgery), a variety of other mechanisms were also recognized.

In an attempt to develop a better understanding of how specific drug-using populations are diverting prescription opioids and other medications, or obtaining controlled drugs that have already been diverted, this article reports on qualitative interviews and focus group data collected on four separate populations of prescription drug abusers in Miami, Florida—club drug users, street-based illicit drug users, methadone maintenance patients, and HIV-positive individuals who abuse and/or divert drugs.

Methods

Between January 2004 and April 2005, the authors conducted focus groups with individuals from four drug-using street- and club-based populations: 1) eight groups with 30 young-adult ecstasy users; 2) four groups with 17 crack, cocaine, and heroin users; 3) one group of eight methadone maintenance clients; and 4) four groups with 19 drug-involved HIV-positive prescription drug diverters. Individual in-depth interviews were also conducted with six HIV-positive individuals and one prescription drug dealer. Participants were recruited through print media advertisements, key informants, and snowball sampling methods. All were screened by telephone or on the street to determine whether they were at least 18 years of age and met drug-use eligibility requirements. All groups were ethnically diverse, including white/ Anglo, Hispanic, African American, and African Caribbean men and women.

Subsequent to informed consent using a protocol approved by the University of Delaware's Institutional Review Board, participants completed a brief demographic and behavioral questionnaire using an identifying pseudonym. This questionnaire was also used to confirm eligibility. In the audio-taped focus group discussions that followed, the participants identified themselves on the tape using the same pseudonym so that the two sources of data could be linked at the individual respondent level. The sessions lasted 60–90 minutes and were guided by a relatively unstructured interview schedule that included open-ended questions about the abuse and methods of diversion of prescription drugs. Participants were compensated \$25 for their participation.

Focus group sessions were transcribed using pseudonyms to identify individual speakers. The transcribed texts were segmented and coded while retaining their links to the original speakers and contexts [38,39], using QSR N6 text analysis software (QSR International, Doncaster, Australia). As this was an exploratory study, the coding themes emerged from the data following a constructivist-oriented grounded theory approach [40,41]. This inductive method entails synergistic iterations of data collection and analysis in an effort to build theoretical frameworks that explain situations and events as respondents experience them.

Results

The Club Culture

Previous work in Miami by the authors revealed that in a sample of 186 ecstasy users recruited from the local club scene, more than 80% reported the abuse of opioids, sedatives, and/or stimulants [42,43]. The average age of onset for the abuse of opioids was 18 years, and in the past 12 months, 23% had abused controlled-release oxycodone (OxyContin), 33% other oxycodone products, 40% hydrocodone, and 8% morphine. None of these individuals using these prescription drugs were doing so for legitimate medical purposes or under the supervision of a physician. Moreover, polydrug use was common in that 29% of the sample reported using one or more prescription medications together with ecstasy. These ecstasy users reported a

variety of health and social problems, in that 30% had drug abuse treatment histories, 45% had been arrested at least once, and 37% had high depression scores.

To further investigate the unexpected findings of widespread prescription drug abuse in this population, a total of 30 male and female club drug users aged 18–45 years from a wide variety of ethnic backgrounds were recruited for participation in eight focus groups during 2005. Although a minority of participants described experimenting with prescription drugs in junior and senior high school, most said that their abuse of prescription opioids and tranquilizers quickly followed their introduction to street stimulants, primarily methamphetamine and ecstasy, for the purpose of easing their coming down from the high that the latter drugs produced. Participants indicated that ecstasy and methamphetamine were often “packaged” by local drug dealers together with prescription opioids or depressants because of the popular demand for a smooth “landing.” Antidepressants were also commonly used by ecstasy and methamphetamine users to ease withdrawal-related depression.

Three additional patterns of continuing club/prescription polydrug abuse were noted among focus group participants: prescription drugs in *combination* with, as *substitutes* for, or as *alternatives* to, club drugs. The use of prescription drugs in *combination* with club drugs was for the purpose of achieving “a better high.” Focus group participants cited numerous examples of preferred drug combinations, including: marijuana, methylphenidate, and alcohol; depressants and/or opioids with methamphetamine; codeine with ecstasy; and hydrocodone with cocaine. One respondent recalled having had an “excellent” night out after ingesting “4 Seroquels, 3 Lillys (olanzapine), 2 ‘bars’ (2 mg alprazolam), alcohol, marijuana and cocaine,” after which he claimed to have successfully driven a carload of friends home. As *substitutes*, participants described the interchangeability of certain club and prescription drugs for the same intended purpose, as in substituting phentermine for methamphetamine to get high, gamma hydroxybutyrate for painkillers plus alcohol to feel drunk, or alprazolam or marijuana to ease withdrawal from stimulants. The third pattern involved the use of prescription drugs as *alternatives* for getting high when club drugs were either unavailable or of poor quality. A number of the participants also described the practice of “colon rolling,” also known as “booty bumping”—dissolving prescription and other drugs and then taking the solution rectally with an eye dropper or turkey baster. This anal route of administration was preferred by some because of the slower and more even onset of the effects of the drug. Of particular note in this regard was the “Royal Flush”—a combination of methamphetamine, ecstasy, and sildenafil (Viagra).

Sources of abused prescription drugs cited by focus group participants were extremely diverse, including their physicians; club drug dealers; parents and other relatives; doctor shopping; leftover supplies following an illness or injury; personal visits to Mexico, South America, and the Caribbean; prescriptions intended for the treatment of mental illness; direct sales on the street and in nightclubs; pharmacy and hospital theft; friends or acquaintances; under-the-door apartment flyers advertising telephone numbers to call; and “stealing from grandma’s medicine cabinet.”

Several participants noted that a major mechanism for obtaining prescription drugs was through Miami Beach “pill brokers” who routinely worked with elderly patients. For example:

The main source of how people (pill brokers) get these pills is Medicare and Medicaid fraud. They’ll send an old man into a pharmacy or they’ll send him to a doctor who’s a little bit crooked. He’s got a broken arm or a bad hip. He complains of pain. Doctor knows what’s going on—he gets kickbacks from patients coming in and stuff through Medicaid. He gets paid for every patient that he sees. We did it with a gentleman who went in to see a doctor and was prescribed OxyContin. So we went right in to Walgreen’s to get them. Then someone (the pill broker) comes over and hands us \$680

for the Oxy-Contins, I think it was what, 80 pills maybe? He got the pills, and I can only imagine the kind of money he made off of them.

This individual also indicated:

They (the “pill brokers”) were in our neighborhood one night asking for people with the red, white and blue card, which is the Medicare/Medicaid card. And if you had one, they'd sign you up right there. I think they paid them \$50 for signing up right there on the spot. They also paid them \$80 for the doctor's visit, and \$200 for the pills.

All participants reported having no difficulty in getting prescription medications, although they were often happy to take what was available without seeking out a specific drug or brand name. Those who had relocated to Miami from other cities indicated that the Miami illicit prescription drug market was significantly easier to navigate than other places they had lived, including New York and Boston. Street prices were reportedly much lower in Miami than those offered by domestic and international online pharmacies. For example, whereas the branded extended-release oxycodone typically sells for \$1 per mg in most parts of the United States, the street price in Miami is only 50 cents. Although focus group participants generally described the “high” from prescription drugs as less exciting and less euphoric than that of illicit drugs, prescription drugs were uniformly perceived to be purer, safer, more respectable, more legal, and having fewer withdrawal symptoms.

Street-Based Crack, Cocaine, and Heroin Users

Four focus groups with 17 street drug users were conducted during April 2005. Participants were ethnically diverse, of both genders, and ranged from 27 to 53 years of age. Although all had prior or current involvement in prescription drug abuse, their careers in substance abuse typically began with alcohol, marijuana, and cocaine—not prescription drugs. The primary prescription drugs of abuse mentioned by participants were hydrocodone, oxycodone (both immediate and extended release), alprazolam, and diazepam. Participants also noted that there was significant abuse among street populations of psychotropic medications used for the treatment of schizophrenia, depression, and anxiety disorders—“psych meds” as they are referred to on the street—such as sertraline (Zoloft), paroxetine (Paxil), and quetiapine (Seroquel). Although a small number of participants initially acquired prescription drugs to treat legitimate medical conditions, the majority began their involvement in order to moderate the effects of street drugs, or as substitutes for cocaine, crack, and heroin. Specifically, sedative drugs were commonly used to “come down” from crack runs or binges or to “mellow out” without having to purchase and consume alcohol, and prescription analgesics were used as “get-high drugs” when street drugs were unavailable.

A primary focus of the groups was to elucidate the sources of abused prescription drugs reaching the streets. In this population of street drug users, diverse methods of acquisition were mentioned, although they diverged somewhat from those available to higher-socioeconomic-status individuals. None of the street-based participants, for example, cited the Internet or personal travel as means to access prescription drugs. Among these individuals, the primary sources for acquiring prescription drugs were: street dealers; script doctors; illegal sales in small pharmacies; acquaintances who sell their personal prescriptions; doctor shopping; friends and family members; sex workers' clients; disability patients; Medicaid recipients; and personal prescriptions intended for the treatment for drug dependence or mental illness. There was a consensus among the participants that script doctors were a reliable source of access to prescription medications, as the supplies available through street dealers and other sources were inconsistent, and tended to wane by the end of each month. Knowledge of particular script doctors was common, as was awareness of the elaborate systems in place to transport individuals with Medicaid coverage to doctors' offices and pharmacies to obtain and fill

illegitimate prescriptions for later resale. Commonly described scenarios for prescription drug access included:

They have people that come pick you up and take you to the clinic, to the pharmacy, put the prescription in, get the pills, and come back. I was introduced to a couple of people in a doctor's office. This was people on Medicaid getting their script drugs and would take it to another source and sell the whole bottle. We're talking like 30 to 60 people and it was like a ring and everybody knew who was getting what and if they wanted it, they'd call that person up. "Hey, have you been to the doctor yet? I've got a buyer for this." They'd go to the doctor right then.

A repeated theme was the involvement of certain pharmacies in Medicaid fraud. One focus group participant elaborated on the illegal pharmacy sales:

There is this pharmacy that will sell you the pills through Medicaid and buy them back. One time this girl asked me "Did you get your pills today?" I said, "Yeah, why?" She said ... she said, "Well next time you can go over there to that pharmacy. He'll give them to you and buy them right back from you. You get them off Medicaid and he'll pay you money for them and put them right back on his shelf and sell them again higher." So, say I pay him \$15 for the pills under Medicaid, and they're worth \$1,000 on the street. So then he might give me \$100 or \$500 for them. Then they go back on the shelf and he sells them again, and he sells for \$1,000 and then he's making that \$1,000 over and over and over.

A number of focus group participants detailed the process of buying and selling of their own medications on the street. For example:

A lot of people out there are selling their pills. Most of it comes from people you know, but then you get a lot of people coming through that have scripts and they want to sell their pills. You could sell or trade. They want to get rock (crack) or they want cocaine and you switch one for the other. Cocaine for Oxy-Contin. Crack for bars (alprazolam). I mean that's how a lot of it comes out here. I mean you don't even have to look for it. It will come to you. Some of them you know from around but some of them you don't even know. They'll drive up to you. They just drive up looking. They will drive up to me and ask me, "You know anybody that wants to buy these?" Or they may ask what you have to sell.

Another focus group member added:

I'm currently on psychotropic medications and I can get any kind of psych meds I want. All I have to do is go ask my psychiatrist. "Hey I need this." Boom, here it is and I'll get it and most of the time I won't take it because they do knock you down and you can't function. So I sell them on the street.

Methadone Maintenance Treatment Clients

Eight clients enrolled in a large methadone treatment clinic also participated in a focus group discussion on prescription drug abuse and diversion in 2005. The majority were white, with an average age of 50 years. All had extensive histories of prescription drug use, both legitimate and illegitimate, primarily with opioids, benzodiazepines, amphetamines, and antipsychotic and antianxiety medications. Several were enrolled in more than one methadone program, and they supplemented their methadone supplies with street purchases of liquid methadone or tablets from pain clinics. For the most part, they echoed the street participants' accounts of prescription drug acquisition, but placed special emphasis on methadone clinics as ideal locations offering virtually unfettered access to any variety of medications. As one participant stated:

Most people wouldn't think of this but at a methadone clinic, everybody that is either looking to get rid of something, or looking to purchase something, will come around a methadone clinic and will come up to you and say, "I've got Xanax." As a matter of fact, last week I had three people come up to me and tell me they had methadone biscuits and Dilaudid and Xanax.

Another agreed:

When I was traveling and I was looking for drugs, whether it be prescription or not prescription and I didn't know where to go in the city, the first thing I did was look up the closest methadone clinic. You can always find something at the methadone clinic, no matter where it is. No matter what state it's in.

While virtually all of the participants admitted to occasional small thefts of medications, sharing medications, or trading medications for street drugs, they were generally the end users of diverted medications, rather than the sellers. As one participant put it:

If I have extra medication and somebody needs some I'd sell it because I need the money, and sometimes, what usually happens is I'll find myself in a situation where I just have to buy them back. I'd sell too many and not have enough for myself. Sometimes it's really not worth doing it so I just keep the pills.

Diversion of Antiretroviral (ARV) Medications

Our recent research with a variety of drug-using populations alerted the authors to the diversion of various prescription drugs by HIV-positive men and women. Specifically, in earlier research, gay men reported that they were often able to acquire prescription benzodiazepines and opioids through their HIV-positive friends. Street and club drug users also indicated that HIV-positive associates were sources of the prescription drugs they abused. They also indicated that there was a thriving market in Miami and other cities involving all of the drugs prescribed to HIV-positive persons, including their ARV medications. To obtain a better understanding of these practices, a series of English- and Spanish-language focus groups and individual interviews was conducted with 25 ethnically diverse HIV-positive men and women in Miami Beach and inner-city Miami during 2005. A number of alarming new trends were indicated:

- The vast majority of participants reported problems with adherence to ARV medications either sporadically or on a chronic basis, due to side effects or regimen complexity, and most had been approached on multiple occasions and asked to sell their medications. Although some refused, many participants acknowledged selling portions or entire bottles of their medications due to financial hardships, while others reported giving medications away to individuals who they felt were in need.
- Several participants had been approached regarding medications sales in and around neighborhood pharmacies, and a handful of participants reported being approached at the conclusion of HIV-support groups they attended at local clinics. One participant compared these pharmacies to street drug-copping areas: "it's just like that, but instead of you going to buy, it's them coming at you, to buy it off you."
- The supply chain for diverted ARV medications includes HIV-positive patients, patient recruiters, "pill brokers," street drug dealers, local "mom and pop" pharmacies who are recycling and reselling various medications, and "script doctors," who prescribe medications in exchange for payment, even to non-HIV-positive individuals.
- There are "spotters" who work with pharmacists in identifying HIV positives for the purpose of buying and reselling ARV medications.

- There are sex workers, crack dealers, and others familiar with the street culture who serve as “go-betweens” to negotiate the sales of ARV medications.
- Due to the wide spectrum of HIV-related conditions and the side effects of ARV drugs, seropositive patients have relatively easy access through their medical providers to a variety of prescription medications of interest to drug abusers, including opioid analgesics, benzodiazepines, erectile dysfunction remedies, steroids, human growth hormone, and dronabinol (Marinol).
- These prescription drugs—including ARV medications—are often traded for cash or illicit drugs by HIV-positive drug users in various settings, including sex parties, nightclubs, and on the street. Many participants mentioned that indigent drug users are prime targets for pill brokers because they are perceived to be “desperate for a fix” and willing to sell their medications at low prices.
- Certain ARV medications—most importantly ritonavir (Norvir), commonly prescribed as a “booster” for other protease inhibitors—have the unintended effect of heightening the psychoactive effects of some illicit drugs as well, especially methamphetamine and ecstasy, and are valued in certain circles as key ingredients in the “cocktails” of psychoactive drugs used to get high; another ARV medication, efavirenz (Sustiva), is also sought by some HIV-negative people for its intoxicating properties.
- The major purchasers of ARV medications include HIV-positive men and women who are unwilling to disclose their serostatus, brokers who are shipping the medications to parts of Latin America and the Caribbean (primarily Haiti, the Dominican Republic, Puerto Rico, Cuba, and Colombia) where they are in short supply or generally unavailable, recruiters who pay kickbacks to Medicaid patients to visit certain medical clinics, and methamphetamine users who use certain HIV drugs to boost the effects of crystal meth.

Discussion

Prescription drug diversion is not a new phenomenon. During the 1960s, for example, it was estimated that more than 100,000 pounds of amphetamines and amphetamine-like compounds were being manufactured annually in the United States, and that half of this production was being diverted to illicit markets [44,45]. In the 1970s, numerous studies documented the abuse and diversion of barbiturates [46,47], other sedative-hypnotics [48,49], pentazocine [50], and methadone [51–53]. Moreover, the first general population survey of drug abuse undertaken in the United States (conducted in New York State in 1970, just 1 year before the first National Household Survey on Drug Abuse), found prescription drug abuse and diversion to be commonplace [54]. The New York survey also documented significant levels of prescription drug diversion. For example:

- 361,000 New York State residents aged 14 years and older reported the “regular use” (6 or more times in the last 30 days) of barbiturates, and 16.6% of these reported obtaining these drugs without a legitimate prescription;
- 525,000 individuals reported the regular use of tranquilizers, and 8.5% of these reported obtaining these drugs without a legitimate prescription;
- 17,000 individuals reported the regular use of prescription opioids, and 23.6% of these reported obtaining these drugs without a legitimate prescription [54].

With the exception of methadone, which was being diverted from treatment programs by methadone maintenance patients [52,55,56], research on the sources and mechanisms of diversion was virtually nonexistent in the scientific literature at that time. During the late 1970s

and early 1980s, there was much in the popular literature about the overuse of prescription drugs, but their widespread availability and use was generally attributed to overproduction by the pharmaceutical industry and overprescribing by physicians.

While doctor shoppers, physicians, and the Internet receive much of the attention regarding diversion, the data reported in this article suggest that there are numerous active street markets involving patients, Medicaid recipients, and pharmacies as well. Many of these individuals have conditions that have been appropriately diagnosed and addressed with a proper course of treatment, but are selling their prescription drugs for profit, or exchanging them for illicit drugs. In addition, there are many individuals posing as legitimate patients for the purposes of scamming physicians and pharmacists or otherwise defrauding the system. But beyond these, there are other data that suggest that the contributions of residential burglaries, pharmacy robberies and thefts, and “sneak thefts”—the distracting of merchants by one individual while another “sneaks” behind a counter or into a storage room to steal [57]—to the diversion problem may be understated.

Residential Burglary

There were an estimated 3.4 million residential burglaries in the United States during 2004 [58], and there is evidence to suggest that prescription drugs are a major target in a significant portion of these crimes. In scores of focus groups and in-depth interviews conducted by the authors with hundreds of drug-involved offenders, active street drug users, and recovering addicts in several states over the past decade, there was a consensus that the four items typically sought in residential burglaries are cash, jewelry, guns, and prescription drugs. This contention, furthermore, is substantiated in the many thousands of newspaper articles each year describing the items stolen in burglaries and home invasions [59–64], and by studies conducted by the Department of Justice [65] and by independent researchers [66,67].

Our focus groups and interviews also identified specific types of residential burglaries that target prescription drugs. One of these is known as “obituary shopping.” Typically, the perpetrator scans the obituaries in local newspapers, looking for the funeral dates and times for individuals who likely passed away as the result of chronic diseases requiring strong pain medications. The home of the deceased is then burglarized during the memorial service or funeral. Another approach involves the stalking of patients attending pain clinics, following them to learn where they reside, and then burglarizing their homes at some later date. A related issue is the filing of false reports to the police and insurance companies regarding burglaries in which prescription opioids were allegedly stolen, with the purpose of getting replacement prescriptions from one or more physicians and/or pharmacists.

Pharmacy Losses

With respect to robberies, burglaries, and other losses through shoplifting, employee pilferage, and “sneak thefts” by professional thieves from pharmacies, distributors, hospitals/clinics, treatment programs, or any other business or organization where controlled substances are stored, the DEA requires that its Form 106 (Report of Theft or Loss of Controlled Substances) describing such losses should be immediately filed. Although the DEA Form 106 data are not routinely tabulated and published, what has been released suggests the potential magnitude of losses. During 2001 through 2003, for example, some 563,677 “standard dosage units” of methadone (1 methadone dosage unit in DEA terminology = 10 mg) were reported as lost or stolen. Some 37.3% of these occurred through night break-ins, 23.1% through employee pilferage, 14.3% through in-transit losses, 6.4% through armed robberies, and 18.6% through “all other” mechanisms [68]. For the branded extended-release oxycodone (OxyContin), the DEA reported that during the period January 2000 through June 2003, almost 1.4 million tablets were lost or stolen through 2,494 separate incidents [69]. Almost half of the losses (47.3%)

occurred through night break-ins, followed by robberies (29.0%), employee pilferage (16.5%), in-transit losses (6.3%), and customer theft (0.8%).

Most recently, a request by the University of Wisconsin under the Freedom of Information Act yielded additional data on this topic [70]. During 2000 through 2003 in 22 eastern states, there were a total of 12,894 theft/loss incidents reported to the DEA, involving some 28 million dosage units of controlled substances. Almost 90% of the reports came from pharmacies. The total number of dosage units lost or stolen for selected opioids was as follows:

- oxycodone 4,434,731
- morphine 1,026,184
- methadone 454,503
- hydromorphone 325,921
- meperidine 132,950
- fentanyl 81,371

In addition, loss estimates for hydrocodone—the most widely prescribed and most frequently diverted of all controlled substances—amounted to some 4 million dosage units lost or stolen in 2003 alone. As such, these data suggest that massive quantities of prescription opioids, regardless of schedule, are being stolen prior to being prescribed.

The Internet

Without question, prescription drugs are illegally purchased over the Internet, but its role as a source for drugs may be overstated. A national probability sample of adults polled by the *Pew Internet and American Live Project* in 2004 found that only 4% of Americans had ever used the Internet to purchase drugs, and that most sites required a physician's prescription [71]. The major reason indicated for not purchasing from Internet sources was the belief that the drugs were not safe. And interestingly in this regard, during numerous structured interviews and focus groups with scores of prescription drug abusers in the Miami club culture, it was repeatedly emphasized that they deliberately avoided the Internet as a source for drugs, because of “rip offs,” because prescription drugs are generally cheaper on the street than on the Internet, and because “big brother is always watching” [42].

It is unlikely that the patterns of prescription drug abuse and diversion illustrated above are unique to Miami. Other studies have documented that the drug abusers described in this article are similar to those in the drug cultures in other urban communities [72–76]. Given this, it is likely that opportunities and mechanisms for obtaining prescription drugs in other locales are also similar.

As a final point here, the diversion of ARV medications is largely a hidden phenomenon; yet anecdotal reports suggest that it is an expanding and highly lucrative enterprise. Although reports of illegal azidothymidine distribution initially surfaced a decade ago [77], the continued development of new and expensive medications to combat HIV or alleviate HIV-related conditions and complications has made these drugs increasingly vulnerable to diversion due to their high cost and consequent high value on the black market [78,79]. Diversion can occur on a global scale, as when shipments of donated ARV medications destined for patients in African nations are routinely intercepted and resold to European pharmacies at a profit [80, 81], or through more informal, local systems and networks. In the United States, HIV drug diversion networks have been uncovered in a variety of locations, and authorities have interrupted such operations in Connecticut, New Jersey, Pennsylvania, New York, Florida, Tennessee, and Georgia [59,78,82–84].

Pilot work by the authors, along with reports in the popular media, indicates that HIV/AIDS patients are emerging as active participants in the diversion of ARV and other medications, along with pharmacists, physicians, and other health care workers. In one common scenario, patients treated for HIV/AIDS legally obtain their prescription medications through Medicaid or other insurance programs and then illegally sell them to a variety of brokers. In some cases, patients sell only duplicate prescriptions obtained by visiting multiple doctors or “doctor shopping.” In other scenarios, patients may sell just those medications that they do not like to take or those that have the highest street value, without understanding the necessity of taking the entire combination, or “cocktail.” Often, pill brokers target patients with prescriptions in hand outside of clinics or pharmacies. Then brokers and “middlemen,” in turn, sell the drugs to wholesalers or back to pharmacies where they are resold for profit or full Medicaid reimbursement [59,78,83–85], or in some cases, are shipped overseas [86]. Nearly always, the actual HIV/AIDS patient is low on the diversion chain, financially benefiting the least from such endeavors. Glasgow [84] reports that patients receive about 10% of the medications' retail value from brokers, while pharmacies pay “middlemen” increments up to nearly half of the full value, still much cheaper than through legitimate wholesalers.

Patients are typically targeted by pill brokers for ARV medications, including lamivudine/zidovudine (Combivir), ritonavir (Norvir), efavirenz (Sustiva), lopinavir/ritonavir (Kaletra) and abacavir/lamivudine/zidovudine (Trizivir), and drugs to treat HIV-related conditions and complications, such as acetaminophen/oxycodone (Percocet), somatropin (Serostim), and dronabinol (Marinol) [82,84,86,87]. For example, Windham [87] reports that somatropin (Serostim), a growth hormone prescribed to fight body wasting, is also used recreationally as an illegal body-building drug. A 3-month supply of somatropin (Serostim) costs some \$21,000, and this high value creates enormous potential for diversion. All too often it is indigent or drug-involved HIV patients who are targeted by pill brokers for medication diversion, recognizing that for patients already marginalized by poverty, homelessness, mental health issues, drug addiction, and medical community mistrust, HIV care is often either a low priority or a concern too difficult to manage [86,88,89] and that relatively small financial incentives can influence their participation in diversion [85,90].

In addition to the substantial financial repercussions to the health care system brought about by such fraudulent practices, the potential health implications of ARV medication diversion are significant. Clearly, for HIV/AIDS patients who are not taking their medications as prescribed, the full health benefits of these treatments are not achieved, and the contribution to HIV-drug resistance is likely substantial. Also, the improper handling, storage, and tampering of diverted ARV medications could potentially alter their effectiveness unbeknownst to final recipients. By taking medications without proper medical supervision, the end users of these diverted medications may also be unaware of the appropriate timing, dosage, and combination requirements, as well as potentially harmful drug interactions that could arise. Specific dangers noted by law enforcement officials include the storage of drugs that require refrigeration in hot vans or car trunks before being sold to wholesalers, as well as the counterfeiting or tampering with drug labels and expiration dates [78,82].

Conclusions

Within the context of the foregoing remarks, and from a clinical perspective, it is important that physicians prescribing prescription drugs with a potential for abuse continue to be vigilant for doctor shoppers, especially in those patient populations previously thought to be of low risk, such as the elderly and HIV positives. Furthermore, research is needed to provide estimates on the magnitude of particular types of diversion and on how the massive quantities of abused prescription drugs are reaching the streets. Of particular importance is better information on the contributions of the Internet and residential burglaries to the diversion equation. These data

will provide critical information for making regulatory decisions and for developing prescription drug abuse prevention programs, educational initiatives for prescribers, and risk management plans for industry and regulatory agencies.

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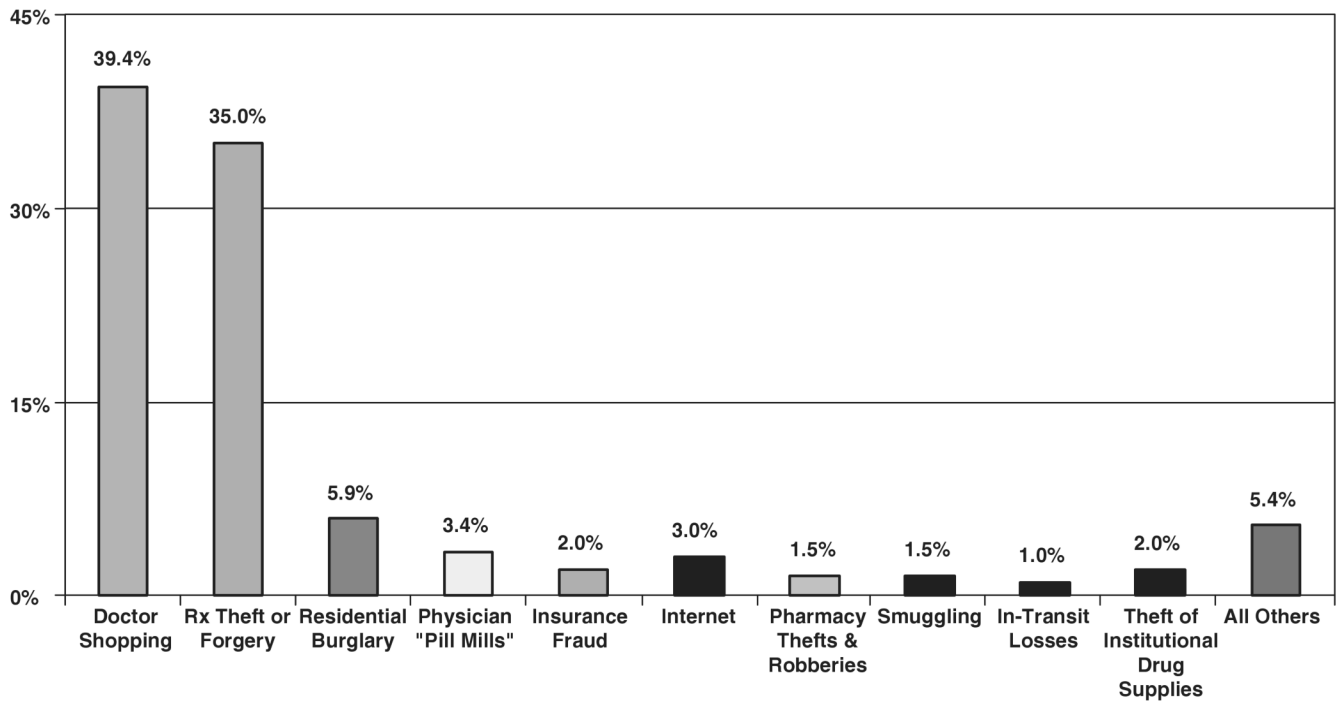


Figure 1. Police and regulatory agency perceptions of the primary sources of prescription drug diversion.