Published in final edited form as:

Acad Pediatr. 2019 ; 19(1): 103–108. doi:10.1016/j.acap.2018.06.012.

Opioids in Adolescents' Homes: Prevalence, Caregiver Attitudes and Risk Reduction Opportunities

Jane M. Garbutt, MB, ChB^{a,b}, Katharine Kulka, BA^a, Sherry Dodd, BA^a, Randall Sterkel, MD^{a,c}, Kathryn Plax, MD^a

^aDepartment of Pediatrics, Washington University St Louis, Campus Box 8116, 660 South Euclid Ave., St. Louis, MO 63110, United States

^bDepartment of Medicine, Washington University St Louis, Campus Box 8116, 660 South Euclid Ave., St. Louis, MO 63110, United States

^cSt. Louis Children's Hospital, 1 Children's Place, St. Louis, MO 63110, United States

Abstract

Objective: The most common source for misused opioids is pain relievers prescribed for family and friends. Our objective was to assess knowledge, attitudes and behaviors of adolescents' caregivers regarding prescribed opioids in the home.

Methods: The self-administered survey was completed by caregivers in the waiting rooms of 12 pediatric practices in the mid-west. Eligibility required living in a home where youth 10 years old were frequently present. 700 of 793 (88.3%) eligible caregivers completed the survey, and 76.8% were the parent.

Results: Of 700 caregivers, 34.6% reported opioids in their home (13.6% active prescription, 12.7% leftover medications, 8.3% both). Of those with an active prescription, 66.0% intended to keep any leftover medications for future need (for the patient 60.1%, someone else 5.9%). Of those with leftover medications, 60.5% retained them for the same reason (for the patient 51.0%, someone else, 9.5%). Others kept medications unintentionally: they never got around to disposing of them (30.6%), did not know how (15.7%), or it never occurred to them (7.5%). Many caregivers were unaware that adolescents commonly misuse opioids (30.0%), use them to attempt suicide (52.3%), and that opioid use can lead to heroin addiction (38.6%). 7.1% would give leftover opioid medications to an adolescent to manage pain and 5.9% may do so.

Conclusion: Opioids are prevalent in homes in our community and many parents are unaware of the risks they pose. Study findings can inform strategies to educate parents about opioid risk and encourage and facilitate timely, safe disposal of unused medications.

Corresponding Author: Jane Garbutt, MB, ChB, Department of Pediatrics, Washington University School of Medicine, Campus Box 8116, 660 S. Euclid Ave., St. Louis, MO. 63110, Telephone: (314) 454-8613; Fax: (314) 286-1149; jgarbutt@wustl.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Potential Conflicts of Interest: The authors have no conflicts of interest relevant to this article to disclose.

Keywords

Opioids; practice-based research network

INTRODUCTION

Opioids are prescribed for pain relief and include hydrocodone, oxycodone, tramadol, morphine, and fentanyl among others. Initially, use of these addictive drugs was restricted to the management of severe acute pain, post-surgical pain and end-of-life care. When use was extended to include chronic pain conditions requiring high-dose and longterm prescriptions, prescribing rates quickly quadrupled.¹ In parallel with increased medication availability, opioid use disorders and opioid-related overdoses and deaths increased.¹⁻⁴ Non-medical use of prescribed opioids increases the risk of heroin use⁵ and increased use of these illicit opioids has markedly increased deaths due to opioid overdose,^{3,4,6,7} resulting in what is now considered to be an opioid overdose epidemic and a national emergency.

Public health efforts to address this urgent public health problem have focused on curtailing opioid prescribing for adults and adolescents, expanding use of medication-assisted treatment to reduce opioid use disorders and overdose, as well as increased identification of patients at risk.^{4,5} Recently there has been an increased focus on research to identify alternative pain medications and public information campaigns.⁸ Although the rate of opioid prescribing and the rate of high-dose prescribing has decreased since 2011, the number of prescriptions with a more than 30 days supply has not changed, and prescribing rates remain three times higher than they were in 1999.^{1,6}

Opioids prescribed for family members and friends are the most common source of pain relievers for misuse, used with and without their permission.⁹ Misuse of prescription pain relievers is defined as use in any way not directed by a doctor, including using drugs without a prescription.⁹ The most recently published U. S. data are from 2016 when 11.5 million people aged 12 and over misused prescribed pain relievers, representing about 4% of the population: there were 42,249 opioid overdose deaths.^{4,10} Misuse of prescribed opioids is an important problem for adolescents. In 2016, about 3.5% of youth aged 12 to 17 (>881,000) misused prescription pain relievers, about half (423,000) doing so for the first time, and 152,000 youth had a pain reliever use disorder.^{9,10} In 2015, 772 opioid overdose deaths occurred in 15–19 year olds.¹¹

Excess availability of prescribed opioids is a risk factor for opioid misuse.⁵ Yet, little is known about the availability of prescribed opioids in homes where youth are present, or why leftover medications are kept. Our research goals were to better understand caregiver's knowledge and attitudes toward prescribed opioids, the availability of these drugs in the homes where youth are present and why leftover medications are retained. This information can inform interventions to reduce adolescents' access to leftover opioids, and augment efforts to reduce misuse, addiction, poisonings, accidental deaths and suicides.

METHODS

Between March 15, 2017 and May 30, 2017, we conducted a survey of parents and other caregivers attending community-based pediatric practices. All study sites were members of the Washington University Pediatric and Adolescent Ambulatory Research Consortium (WU PAARC). WU PAARC is a practice-based research network (PBRN) of community pediatricians and pediatric nurse practitioners associated with Washington University. Twelve of 35 WU PAARC-associated practices agreed to participate and all were located in the St. Louis metropolitan area. The study was approved by the Washington University Human Research Protection Office, requiring verbal consent for study enrollment.

Study Population

Survey participants were parents (including step-parents and legal guardians) or other caregivers who accompanied a child for an appointment and reported they regularly had a youth in their home aged 10 or older. Caregivers who were not proficient in English, were under the age of 18, or who had already completed the survey were excluded.

Study Procedures

At each site, study participants were recruited during weekdays by one of two research assistants (RA). The RA approached individuals in the waiting room to assess their eligibility for the survey, invite them to participate, explain participation requirements and answer questions. The RA did not approach parents who were immediately called to see the provider, were occupied with an administrative task, were only present to pick up paperwork or a prescription, or were busy talking with another parent or talking on the phone.

To accommodate participant preferences and office workflow, an electronic version on an Apple iPad Tablet and a paper version of the survey were used. Both versions were offered and the preferred method was chosen by the participant. After completion, the participant returned the completed survey to the RA.

Survey Tool

The 23-item self-report, anonymous questionnaire, was developed by the study team, based on the literature and modified following pilot testing with eight participants. It took between 3 and 5 minutes to complete and had a Flesch-Kincaid reading level of 10.2.

Questions addressed participants' attitudes, beliefs, and behaviors regarding opioid pain medications. Participants reported if they had any prescribed opioid pain medications in their home from an active or old prescription. By selecting from a list, they indicated the type of opioid and what they planned to do or had done with any leftover medications. Using categorical scales, they indicated their likely behavior regarding providing opioid medications to an older child or adolescent for non-medical use for two indications: to control pain and to help them sleep. Response options included "I would do it for severe pain/severe sleeping problem," "I would do it for moderate pain/moderate sleeping problem," "I may do it," "I would never do it". Participants reported whether or not opioid pain medications in their home had ever been used by someone other than the person they

were prescribed for (“yes”, “no”, “don’t know”, “does not apply”). They also indicated how much they agreed with a series of statements (“strongly agree”, “agree”, “disagree”, “strongly disagree”, “don’t know”) about the risk of opioids for addiction, and for abuse in adults and in adolescents, for heroin addiction, and for suicide in adolescents. Demographic information was also obtained.

Statistical Analyses

Summary statistics are reported as percentages for categorical variables and median (range or interquartile range, IQR) for continuous variables. We compared demographic criteria, participant’s relationship to child (parent vs. other caregivers), their knowledge about opioids and their intent to share opioids with an adolescent for pain relief (would do and may do for severe or moderate pain) between those who did and did not have any opioids at home (combining those reporting medications available from an active and old prescription) using Pearson Chi-square test, Fisher’s Exact test, or Student’s t-tests for between-group analyses as appropriate. For these analyses, we summarized demographic criteria as follows: racial group (white, black, other), health insurance (Medicaid vs. other insurance), family income (>\$100,000/year vs. less income) and participant’s education (bachelor’s degree or higher vs. less education). For the comparisons of knowledge about opioids, we combined the responses for the knowledge questions of “strongly agree” and “agree” and “strongly disagree” and “disagree” and report each knowledge question as 3 categories: “agree”, “disagree” and “don’t know.” We made these choices to summarize the data either because of small cell size (eg, some racial groups, strongly disagree) or to permit comparison with other studies. A probability of $p < 0.05$ (two-tailed) was used to determine statistical significance. All statistical analyses were performed using STATA 12 (StataCorp LP, College Station, TX).

RESULTS

Study Participants

The 12 participating WU PAARC practices (11 group practices, 1 solo practitioner) were located throughout the St. Louis metropolitan area (10 Missouri, 2 Illinois; 11 suburban, 1 rural). Using self-reported data routinely collected to characterize our PBRN, we determined that participating practices did not differ from non-participating practices in their location, practice arrangement, number of physicians, presence of an electronic medical record, percentage of patients who were black, had Medicaid insurance, or Hispanic ethnicity. An RA was present at each site for a median of 4.0 days (range 4.0 to 6.5 days) for study recruitment.

During the time the RA was present in these 12 offices, 2295 individuals attended for an appointment. Of these, 195 (8.5%) were not approached by the RA, most often because they were immediately called back to see the provider. Of the 2100 who were invited to participate, 1307 (62.2%) were ineligible (1022 no child 10 years old who was regularly in the home, 34 minors, 6 non-English speaking, 40 repeat appointment, 205 had no appointment e.g., they were collecting paperwork or a prescription). Of the 793 who were eligible, 93 (11.7%) declined and 700 (88.3%) completed the survey (Median 53.5 surveys

per practice; range 18 to 105). Of the 700 study participants, 53.5% completed the electronic survey and 46.5% completed the paper survey.

Most (78.8%) respondents were the parent (66.7% mother, 12.1% father) of the child attending the appointment; 76.6% lived in 2-parent homes and 39.1% had not graduated from college (Table 1). Twenty percent were black and 26.0% used Medicaid insurance for the child.

Caregiver's Knowledge About and Attitudes Towards Opioid Risks

Caregivers' responses to the opioid knowledge questions are presented in Table 2. The majority of respondents agreed that opioids are a common drug of abuse among adults (87.3%) and adolescents (69.2%) and that they are addictive (86.2%). Fewer agreed that opioid use can lead to heroin addiction (61.0%) or that opioids are commonly used in suicide attempts by adolescents (46.9%).

If leftover opioids were available to them, 7.1% of respondents indicated that they would use them to provide pain relief for an adolescent (6.4% for severe pain, 0.7% for moderate pain) and 5.9% indicated they may do so to control pain. Fewer would use them for an adolescent with sleeping difficulties (0.9% severe sleeping problem, 0 moderate) and 1.0% may do so. Fourteen percent (101) of all respondents indicated that opioids had ever been misused in their home (77.7% denied use, 4.1% does not apply, 3.1% don't know).

Prevalence of Opioids in the Home

Twenty-two percent (153/700) of respondents had medications from an active opioid prescription at home and 21.0% (147/700) had opioid medications at home leftover from a prior prescription. Most (57.8%) of the leftover medications had been prescribed within the past year; 28.6% were prescribed 1 to 3 years previously and 12.2% more than 3 years ago. The most common opioids reported were hydrocodone (57.5% of active prescriptions and 49.7% of leftover medications), oxycodone (30.1% of active prescriptions and 37.4% of leftover medications) and codeine (20.9% of active prescriptions and 29.9% of leftover medications). In total, 34.6% (242/700) of survey respondents had opioids at home (95, 13.6% active prescription only, 89, 12.7% leftover medications only, 58, 8.3% both).

Reasons To Keep Left-over Opioids

Sixty-six percent of respondents who reported an active prescription intended to keep any leftover medications in case they were needed in the future (by the patient 60.1% or someone else 5.9%), while 26.1% reported they planned to get rid of any leftover medications immediately. Of those who had leftover medications in the home, 61.0% reported this was deliberate, most commonly in case they were needed in the future (by the patient 51.0% or someone else 9.5%). Respondents also kept medications because a lot were leftover (11.6%), or because they were expensive and they did not want to waste them (10.2%). Others reported retention was more unintentional, either they never got around to getting rid of leftover medications (30.6%), they wanted to get rid of them but did not know how to do so (15.7%), or it never occurred to them (7.5%). (Percentages sum to more than 100% as multiple responses were allowed).

Risk Factors for the Presence of Opioids in the Home

Risk factors for the presence of opioids in the home identified in the univariate analyses (combined active prescription and leftover from old prescription) are presented in Table 3. Factors that increased the likelihood of opioids in the home were a higher family income and higher caregiver education. Opioids were less common if the caregiver lived in a rural area. Data are not shown, but the prevalence of opioids in the home did not vary by respondent's relationship to the youth, their race, household type or use of Medicaid insurance. Additionally, prevalence did not vary by respondent's knowledge about risks associated with opioid use or their intent to share opioids with adolescents for pain.

DISCUSSION

Opioids prescribed for family members and friends are the most common source for misuse.⁹ Findings from this large, community-based study suggest that opioids are in plentiful supply in the community and that there is an urgent need to address this problem. Prescribed opioids were present in one in three homes in the study sample, a robust estimate that is consistent with previous smaller studies.^{12,13} Although we did not assess storage of these medications, other studies suggest that safe storage is uncommon and unsupervised access to opioids in the home for youth is widespread.^{14,15} Also concerning was the finding that one in ten caregivers were willing to share leftover opioids with adolescents for pain management. These findings suggest an urgent need for education for caregivers about the risks to their children of easy access to opioid medications prescribed for someone else.

Our findings suggest that many caregivers do not understand the risks associated with misuse of prescribed opioids. Half of survey respondents were unaware that opioids are commonly used in adolescent suicide and over a third did not know about the risk of progression to heroin use.⁵ Yet, prescribed opioids and heroin are most often used by teenagers who attempt suicide by an overdose.^{17,18} After marijuana, prescribed pain relievers are the most common drug of initiation for illicit drug use,¹⁹ and non-medical use of prescribed opioids is a strong risk factor for heroin use.^{5,20} This lack of understanding regarding the risks associated with misuse of prescribed opioids is worrisome and may underlie the absence of caregiver concern about keeping leftover opioids in the home.²¹ Indeed, in our study, 14% of caregivers were aware of opioid misuse in their home. In addition, risk perception amongst adolescents of occasional narcotic use is low.²² In 2016, fewer high school students considered occasional use of opioids as "very risky" than chose this rating for smoking 1–5 cigarettes per day,²³ and adolescents may view prescription opioids as safer than illicit drugs.²² Education is needed to change attitudes of adolescents and their caregivers towards misuse of prescribed opioids.²⁴

Study findings can inform a campaign to reduce access to opioids in the home. We learned that some caregivers kept leftover opioid medications unintentionally, either because they had not got around to disposing of them or were unaware of how to do so safely. Others kept the medications deliberately in case they were needed in the future by the patient they were prescribed for or by others. Pediatricians and other primary care providers could identify those at risk by inquiring about prescribed opioids in the home, for example, when prescribed for wisdom tooth extraction, or for another family member. Providers could

encourage storing active prescriptions in a locked container and strongly recommend that parents avoid sharing prescribed medications and remove all leftover medications from the house.²⁵ A provider recommendation to dispose of leftover medications and a discussion regarding how to do so is associated with increased medication disposal,²⁶ although we found no prospective studies to evaluate this approach. Providers could also educate parents and adolescents about the risks of opioid misuse and encourage parents to discuss these risks with their children. Our finding that opioids are more commonly found in homes of families with higher socioeconomic status suggests that such a campaign is relevant and needed for all families.

Currently, reliable information about safe disposal is difficult to access. Often, it is not provided when the drugs are dispensed²⁷ and there is conflicting information from government sources available on the internet. The U.S. Food and Drug Administration (FDA) suggests flushing opioids for immediate human safety or throwing them in the garbage after they are mixed with used coffee grounds or kitty litter and packaged in a sealed container so they cannot be reused.^{28,29} However, there are concerns that opioids in the water supply may harm fish, wildlife and humans.²⁹ To avoid environmental contamination, a preferred option is to use designated safe-disposal sites. Providers can refer parents to a Drug Enforcement Agency (DEA) website to identify local safe disposal sites and mail-back collectors.³⁰ A more convenient option might be to dispense specially designed medication disposal bags with every opioid prescription,³⁰ a strategy recently deployed by Walmart.³¹ Parents and other caregivers need access to a disposal process that is effective, easy, and safe.

Our study is the first large, community-based survey to assess the availability of prescribed opioids in the homes of parents and other caregivers who live in homes frequented by youth and our response rate was high. The estimate from our sample of 700 caregivers that one third of households contained at least one opioid prescription is robust and similar to other, smaller studies.^{12,13} Yet several limitations of this study need to be noted. Participants were English-speaking caregivers recruited at pediatric practices in a metropolitan area in the Midwest United States, and this convenience sample may not be representative of all caregivers from our PBRN or from other locations. Indeed, misuse of prescribed pain medications among 12–17 year olds is higher in Missouri than national estimates.³² Also, data were self-reported and not verified and may be subject to recall bias. However, potential inaccuracies may have been mitigated by the anonymous and self-administered nature of the questionnaire.

CONCLUSION

Our findings suggest that parents and other caregivers need education regarding the risks of opioids for children and adolescents together with encouragement to dispose of unused medications and access to a safe disposal system. Although not common prescribers of opioids, pediatricians could help to counteract the threat that opioid medications pose for children and adolescents by asking about prescribed opioids in the home, educating about the risks they pose, and recommending and facilitating timely and safe disposal of unused

medications. Research is needed to develop and evaluate such primary-care based interventions.

ACKNOWLEDGEMENTS

The authors wish to thank Dr. Karen Ruecker, MD for manuscript review, Sharon Graham for data collection, and the pediatric practices which allowed us to carry out data collection in their offices: The Children's Clinic, Esse Health Mason Road, Fenton Pediatrics, Dr. Caryn Garriga's Pediatric Practice, Heartland Pediatrics, Johnson Pediatric Center, Mercy Pediatrics – Washington, Nagireddi Pediatrics, Pediatric Healthcare Unlimited, Rainbow Pediatrics, Tots Thru Teens, and WingHaven Pediatrics.

Funding Source: This study was supported by the Washington University Institute of Clinical and Translational Sciences grant UL1 TR000448 (PI: B. Evanoff) from the National Center for Advancing Translational Sciences (NCATS) of the National Institutes of Health (NIH), with co-funding from St. Louis Children's Hospital. This study's contents are solely the responsibility of the author and do not necessarily represent the official view of NCATS, or NIH. The sponsors had no involvement in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Abbreviations:

AAP	American Academy of Pediatrics
DEA	Drug Enforcement Agency
FDA	Federal Drug Administration
GED	General Education Diploma
IQR	Interquartile Range
NIH	National Institutes of Health
PBRN	Practice-based research network
RA	Research Assistant
sd	Standard Deviation
WU PAARC	Washington University Pediatric and Adolescent Ambulatory Research Consortium

REFERENCES

1. Guy GP Jr., Zhang K, Bohm MK, et al. Vital Signs: Changes in Opioid Prescribing in the United States, 2006–2015. *MMWR Morbidity and mortality weekly report*. 2017;66(26):697–704. [PubMed: 28683056]
2. Paulozzi LJ, Kilbourne EM, Desai HA. Prescription drug monitoring programs and death rates from drug overdose. *Pain medicine*. 2011;12(5):747–754. [PubMed: 21332934]
3. Rudd RA, Aleshire N, Zibbell JE, Gladden RM. Increases in Drug and Opioid Overdose Deaths--United States, 2000–2014. *MMWR Morbidity and mortality weekly report*. 2016;64(50–51):1378–1382. [PubMed: 26720857]
4. Seth P, Scholl L, Rudd RA, Bacon S. Overdose Deaths Involving Opioids, Cocaine, and Psychostimulants—United States, 2015–2016. *Morbidity and Mortality Weekly Report*. 2018;67(12):349. [PubMed: 29596405]

5. Compton WM, Jones CM, Baldwin GT. Relationship between Nonmedical Prescription-Opioid Use and Heroin Use. *N Engl J Med*. 2016;374(2):154–163. [PubMed: 26760086]
6. Schuchat A, Houry D, Guy GP Jr., New Data on Opioid Use and Prescribing in the United States. *Jama*. 2017;318(5):425–426. [PubMed: 28687823]
7. Gostin LO, Hodge JG Jr., Noe SA. Reframing the Opioid Epidemic as a National Emergency. *Jama*. 2017;318(16):1539–1540. [PubMed: 28832871]
8. Skolnick P The Opioid Epidemic: Crisis and Solutions. *Annu Rev Pharmacol Toxicol*. 2018;58:143–159. [PubMed: 28968188]
9. Hughes A, Williams MR, Lipari RN, Bose J, Copello EAP, Kroutil LA. Prescription drug use and misuse in the United States: Results from the 2015 National Survey on Drug Use and Health. NSDUH Data Review. 2016.
10. Results from the 2016 National Survey on Drug Use and Health: Detailed Tables. Substance Abuse and Mental Health Services Administration;2017.
11. Curtin SC, Tejada-Vera B, Warner M. Drug overdose deaths among adolescents aged 15–19 in the United States: 1999–2015. Hyattsville, MD: National Center for Health Statistics;2017.
12. Wiecekiewicz SM, Kassamali Z, Danziger LH. Behind closed doors: medication storage and disposal in the home. *The Annals of pharmacotherapy*. 2013;47(4):482–489. [PubMed: 23535813]
13. Friese B, Moore RS, Grube JW, Jennings VK. How parents of teens store and monitor prescription drugs in the home. *Journal of drug education*. 2013;43(3):223–233. [PubMed: 25429166]
14. Ross-Durow PL, McCabe SE, Boyd CJ. Adolescents' access to their own prescription medications in the home. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*. 2013;53(2):260–264. [PubMed: 23683499]
15. McDonald EM, Kennedy-Hendricks A, McGinty EE, Shields WC, Barry CL, Gielen AC. Safe Storage of Opioid Pain Relievers Among Adults Living in Households With Children. *Pediatrics*. 2017;139(3).
16. Dowell D, Zhang K, Noonan RK, Hockenberry JM. Mandatory Provider Review And Pain Clinic Laws Reduce The Amounts Of Opioids Prescribed And Overdose Death Rates. *Health affairs*. 2016;35(10):1876–1883. [PubMed: 27702962]
17. Tadros A, Layman SM, Davis SM, Bozeman R, Davidov DM. Emergency department visits by pediatric patients for poisoning by prescription opioids. *The American journal of drug and alcohol abuse*. 2016;42(5):550–555. [PubMed: 27398815]
18. Warner M, Trinidad JP, Bastian BA, Minino AM, Hedegaard H. Drugs Most Frequently Involved in Drug Overdose Deaths: United States, 2010–2014. *National vital statistics reports : from the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System*. 2016;65(10):1–15.
19. Lipari RN, Ahrnsbrak RD, Pemberton MR, Porter JD. Risk and protective factors and estimates of substance use initiation: Results from the 2016 National Survey on Drug Use and Health. NSDUH Data Review. 2017.
20. Olsen Y The CDC Guideline on Opioid Prescribing: Rising to the Challenge. *Jama*. 2016;315(15):1577–1579. [PubMed: 26978227]
21. Frese WA, Eiden K. Opioids: nonmedical use and abuse in older children. *Pediatrics in review*. 2011;32(4):e44–52. [PubMed: 21460089]
22. Volk K Rise in Prescription Drug Misuse and Abuse Impacting Teens. 2014; <https://www.samhsa.gov/homelessness-programs-resources/hpr-resources/teen-prescription-drug-misuse-abuse>. Accessed October 26th, 2017.
23. Johnston LD, O'Malley PM, Miech RA, Bachman JG, Schulenberg JE. Monitoring the Future national survey results on drug use, 1975–2016: Overview, key findings on adolescent drug use. Ann Arbor: Institute for Social Research: The University of Michigan;2017.
24. Adolescent Substance Use: America's #1 Public Health Problem. 2011; <https://www.centeronaddiction.org/addiction-research/reports/adolescent-substance-use-america's-1-public-health-problem>. Accessed October 26th, 2017.
25. de la Cruz M, Reddy A, Balankari V, et al. The Impact of an Educational Program on Patient Practices for Safe Use, Storage, and Disposal of Opioids at a Comprehensive Cancer Center. *The oncologist*. 2017;22(1):115–121. [PubMed: 27742907]

26. Narcotics in the Medicine Cabinet: Provider Talk is Key to Lower Risk. University of Michigan CS Mott Children's Hospital National Poll on Children's Health 2016;26(4).
27. Kennedy-Hendricks A, Gielen A, McDonald E, McGinty EE, Shields W, Barry CL. Medication sharing, storage, and disposal practices for opioid medications among US adults. JAMA internal medicine. 2016;176(7):1027–1029. [PubMed: 27295629]
28. How to Dispose of Unused Medicines. FDA Consumer Health Information 2013; <https://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm107163.pdf>. Accessed November 3rd, 2017.
29. Drugs in the Water. 2011; https://www.health.harvard.edu/newsletter_article/drugs-in-the-water. Accessed November 5th, 2017.
30. Vimont C New Drug Deactivation System Allows Patients to Safely Dispose of Opioids at Home. 2016; <https://drugfree.org/learn/drug-and-alcohol-news/new-drug-deactivation-system-allows-patients-safely-dispose-opioids-home/>. Accessed November 5th, 2017.
31. Baig E Walmart takes on opioid crisis, offering free solution to safely dispose of unused meds. USA Today. January 17,2018, 2018.
32. 2015–2016 NSDUH State Prevalence Estimates. Substance Abuse and Mental Health Services Administration;2017.

What's New:

Opioid medications are in one third of adolescents' homes. Many parents and other caregivers are unaware of the risks opioids in the home pose for adolescents.

Table 1.

Characteristics of Survey Respondents (N=700)

Characteristic	Percentage (N)
Relationship to child	
Mother	66.7% (467)
Father	12.1% (85)
Grandparent	6.4% (45)
Sibling	5.1% (36)
Other Relative	7.9% (55)
Other	0.71% (5)
Missing	1.0% (7)
Age in years, median (IQR)	40.0 (35–47)
Racial group	
White	73.7% (516)
Black	20.3% (142)
Other	4.9% (34)
Missing	1.1% (8)
Hispanic or Latino	
Yes	2.9% (20)
No	96.4% (675)
Missing	0.7% (5)
Education level	
High school, no diploma	2.3% (16)
High school graduate or GED	15.1% (106)
College- no degree	21.7% (152)
Associate's degree or equivalent	14.7% (103)
Bachelor's degree	27.3% (191)
Graduate or professional degree	17.1% (120)
Missing	1.7% (12)
Family type	
Two-parent family	76.6% (536)
One-parent family	19.3% (135)
Other	3.6% (25)
Missing	0.6% (4)
Family income/year	
<\$30,000	20.1% (141)
\$30,001 to <\$60,000	16.6% (116)
\$60,001 to <\$70,000	10.0% (70)
\$70,001 to <\$100,000	15.0% (105)
\$100,001 or more	33.0% (231)

Characteristic	Percentage (N)
Missing	5.3% (37)
Health insurance	
Work-related insurance	54.6% (382)
Medicaid	26.0% (182)
Private Insurance	13.0% (91)
Other	2.7% (19)
Missing	3.7% (26)
Living Area	
Urban, inner city	9.4% (66)
Urban, not inner city	15.4% (108)
Suburban	54.4% (381)
Rural	18.6% (130)
Missing	2.1% (15)
State of Residence	
Missouri	80.6% (564)
Illinois	18.4% (129)
Missing	1.0% (7)

GED = General Education Diploma

IQR = Interquartile Range

Table 2.

Adolescents' Caregivers' Knowledge About Opioids, N=700

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	Missing
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
Opioids are addictive	53.6 (375)	32.6 (228)	3.3 (23)	0.9 (6)	9.0 (63)	0.7 (5)
Opioids are a common drug of abuse in adults	52.3 (366)	35.0 (245)	2.0 (14)	0.4 (3)	9.6 (67)	0.7 (5)
Opioids are a common drug of abuse in adolescents	33.6 (235)	35.6 (249)	4.0 (23)	0.7 (5)	25.3 (177)	0.9 (6)
Use of opioids can lead to heroin addiction	34.1 (239)	26.9 (188)	2.9 (20)	0.7 (5)	35.0 (245)	0.4 (3)
Opioids are commonly used in suicide attempts by adolescents	19.3 (135)	27.6 (193)	3.1 (22)	0.6 (4)	48.6 (340)	0.9 (6)

Table 3.

Risk factors for the presence of opioid medications in the home.

Characteristics	Opioids present	No opioids present	P-value
Income (n=663)			
> \$100,000/year	40.7%	59.3%	0.02
Less income	31.9%	68.1%	
Caregiver education (n=688)			
Bachelors degree or higher	41.2%	58.8%	0.001
Less education	29.2%	70.8%	
Area of residency (n=685)			
Rural	23.9%	76.2%	0.02
Suburban	37.3%	62.7%	
Urban	37.4%	62.6%	