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Opioid Seeking Behaviors and Diversion in Hospitalized Pediatric Patients: A Case Series

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ABSTRACT

All nurses have a responsibility for monitoring their patients for signs of substance misuse or substance use disorder. Adolescents and young adults are at risk for substance use. Prescription medications may be used by adolescents for non-medical reasons such as to feel high, to assist with sleep, to avoid negative feelings or thoughts or to avoid withdrawal symptoms after chronic use. Some adolescents with legally prescribed medications have been asked to divert those medications by giving them to someone else. Drug diversion by employees is often reported in healthcare settings, but diversion of medications done by patients is far less commonly reported. This paper is a report of two patients with complex medical issues and chronic pain who diverted opioid medications while hospitalized. Hiring clinical staff, such as nurses, working in Drug Diversion Prevention positions will provide knowledge and expertise to facilitate investigations and to help reduce risks for diversion in healthcare settings. In addition, nurses with concerns about patient diversion should discuss these concerns with the care team. Organizational leaders need to support their teams by providing education and resources so staff feel comfortable addressing these challenging situations.

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Introduction

Almost 1 in 4 high school seniors in the United States will have exposure to prescription opioids for either medical or nonmedical use (McCabe, West, Teter, & Boyd, 2012). The non-medical use of opioids, defined as intentional use without a prescription or outside of the indications of a prescription, indicates adolescents and young adults are at higher risk for transitioning to heroin use, injection drug use, overdose and hepatitis C infection among other harms (Marshall, Green, Yedinak, & Hadland, 2016). Some of these risks are the result of inappropriate use of medications by crushing pills to provide more immediate effect when they are swallowed, snorted or injected (Fournier & Levy, 2006). Estimated prevalence of lifetime use of prescription opioids among high school seniors in a study from 2007 to 2009 revealed 17.6% for medical use, while the estimated prevalence of non-medical use for prescription opioids was 12.9% (McCabe et al., 2012). Alarmingly, up to 80% of those with a previous opioid prescription admitted to using the remaining pills for nonmedical reasons (McCabe et al., 2012). Non-medical use tends to fall within two categories, either self-medication (to provide some therapeutic relief) or recreational (experimenting or taking the medications to get high) (Young, Glover, & Havens, 2012). Pediatric and adolescent use of opioids is primarily for pain relief (Weiss et al., 2014). However, non-medical use of opioids is done for reasons such as getting high, relieving anxiety or depression, improving sleep, or avoiding bad memories (Boyd, McCabe, Cranford, & Young, 2006). Opioids may also be taken in combination with other substances as a means to enhance the effects of other drugs or alcohol (McCabe, West, & Boyd, 2013) which can greatly increase the risk of sedation and/or respiratory depression.

The primary reasons patients with chronic pain continue opioid use are to avoid the signs and symptoms of withdrawal and for pain relief (Weiss et al., 2014). Many people who have been taking opioids chronically have concerns or fears about stopping the medications and many experience some symptoms of withdrawal. Unfortunately, the likelihood of having substance abuse or meeting criteria for dependence is significantly higher if misuse of opioids occurs in the early adolescent years (McCabe, Veliz, & Schulenberg, 2016; Winters, Tanner-Smith, Bresani, & Meyers, 2014).

Non-medical use of prescription drugs extends beyond opioids and includes other classes of medications such as stimulants and benzodiazepines (McCabe, Boyd, & Teter, 2006; Setlik, Bond, & Ho, 2009). The Monitoring the Future 2018 report showed that misuse of prescription medications by adolescents was reported at 5% for sedatives/tranquilizers, 4.6% for Adderall (stimulant) and 3.4% for opioids (National Institute on Drug Abuse, 2018). Much of what we see in the literature is based on self-reported use and is likely underreported (Boyd et al., 2006; McCabe et al., 2013; McCabe et al., 2016). Not only are young adults using drugs in illicit ways but 27–54% had been asked to divert their medication after receiving prescriptions for themselves (McCabe

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et al., 2006; McCabe, Knight, Teter, & Wechsler, 2005). It is less apparent how many adolescents actually concede to these diversion requests by giving medications to someone other than to whom the medication is prescribed. McCabe et al. (2013) found there were significant associations between a patient's medical misuse of opioids in the past year and diversion of prescription opioids. Diversion may occur when someone (a) is approached to give their opioids to another person, (b) loans medication to another person and (c) trades opioids for something else (McCabe et al., 2013). Diversion of prescription medications by adolescents is routinely discussed in the literature (Donado et al., 2019; Young et al., 2012) but probably discussed less than warranted in primary or acute care.

There are many risk factors that can contribute to prescription drug misuse and ongoing abuse (SAMHSA, 2016). Few states allow adolescents to seek drug treatment without consent of a parent (Winters et al., 2014). Additional barriers exist for adolescents, such as the perception that drug use is not a problem or poor insight into the scope of the problem and their decision making regarding the situation (Winters et al., 2014). Adolescents may be misusing prescription medications because of their access and because of a belief that they are safe to use since they have been prescribed by a healthcare provider (Setlik et al., 2009). Fortunately, there has been a decline in reported rates of misuse of prescription opioids in high school seniors with only 32.5% stating they were easy to obtain compared to 54.2% in 2010 (NIDA, 2018).

Patient A

Patient Information

Patient A is an adolescent male treated for chronic pain and a rare disorder encompassing complications to his vascular system, gastrointestinal failure, inflammation, asthma, weight loss, fatigue and other symptoms (further details of the case are being excluded to protect the identity of the patient). Patient A had been on long term total parenteral nutrition along with long term opioids for chronic pain. Patient A was known to have had multiple central line infections resulting in bacteremia and hospital admissions. Patient A had been discharged 5 days prior to the admission for sepsis, then readmitted for positive blood cultures with three different types of bacteria and reported 10/10 abdominal, chest and back pain. Multiple sub-specialists were consulted during this admission to assist with determining the cause of his recurring concerns and pain. Multiple interventions were attempted, some with minimal to no relief of symptoms. Around two weeks after admission the nursing staff escalated concerns around the patient's continuous opioid infusions. An interdisciplinary team, called the SAFTeam (Strengthening Alliances with Families Team), was convened to discuss concerns around the patient potentially manipulating his opioids via the infusion pumps. The SAFTeam is made up of the primary medical or specialty service providers, nursing leaders, psychiatry, social work, risk management, patient advocate, ethics, and others required based on the specific case being discussed (i.e. Pain Service in this scenario). The purpose of the SAFTeam is to provide evaluation and support during situations where relationships between the healthcare providers and patients and families are challenging.

Clinical findings

Nurses on the unit had been identifying concerns and escalating their findings to nursing leadership for about a week. Their concerns included (a) medication pumps seeming to have been manipulated, (b) clamped intravenous (IV) tubing, (c) the pump alarming that the bag was empty when not expected, (d) finding extra supplies including empty syringes in the patient room, (e) missing IV supplies (syringes, saline flushes) that had just been delivered to the room, (f) an oral syringe full of medication in the room (thought to be oxycodone) which was not ordered for the patient, (g) patient requesting his nurses push or infuse IV medications more rapidly, (h) a nurse entering the room to find the patient pushing a button on the medication pump and (i) a nurse found pills laying in the patient's bed when administering the morning medications to him. The nurses escalated their concerns to the nursing leadership and the physician. The patient's mother became frustrated when approached with the concerns and verbalized she felt staff were accusing her son of wrong doing. The interdisciplinary team decided to meet and discuss the safety of his care and the ongoing concerns.

Timeline

This patient had multiple previous admissions for central line infections, some of which were unexplained or grew bacteria that were unexpected based on his medical status. He also had ongoing treatment for chronic pain including receiving IV pain medications while at home between hospital admissions. The hospital team felt this patient might be manipulating his medication pumps and that it was no longer safe to have him alone in the room with IV medications infusing. The provider ordered for a staff person to be present in the room at all times with the patient.

After discussions with the patient and parent, they denied ever having used pain medications inappropriately or manipulating any of the pumps infusing pain medications. Despite the patient and family's response the hospital team determined it was safest to wean the patient off of IV opioids after consulting with the chronic pain service. Within a week the patient and his mother requested to be discharged from the hospital with outpatient follow up care scheduled.

During a subsequent hospital admission, the patient admitted to manipulating his pain pumps and medications and was remorseful of his actions. The patient was told if he was readmitted he would be required to have a staff member with him at all times and that use of opioids would be closely monitored and limited if at all possible. He later completed an outpatient chronic pain program and was weaned off of opioids completely. A verbal agreement was made with the patient and family for future admissions so that trust with his care team could be reestablished and future restrictions lifted. The patient continued to seek support through pain clinics to develop coping skills to better handle his pain without opioids. Future admissions then allowed for opioids as needed for up to 5 days while inpatient but no outpatient opioid prescriptions for use after discharge from the hospital.

Patient B

Patient information

Patient B also had chronic conditions; a female adolescent patient similarly being treated for chronic pain with a history of glycogen storage disease, pulmonary hypertension and requiring long term use of total parenteral nutrition. Patient B had multiple complications with her gastric tube including skin breakdown and chronic abdominal and esophageal pain. Due to an extended hospital course (greater than 9 months) and a poor prognosis, this patient was struggling to cope with her multiple chronic illnesses and lengthy hospitalizations. The care team was working to engage her in creating shared goals around her healthcare. Patient B had pain management with patient controlled analgesia (PCA) for several months with infusions of IV morphine. During this course, her treatment included combinations of nurse administered bolus infusions, continuous infusions and patient demand doses where she physically pushed the button to administer a prescribed amount of medication at set frequencies. Patient B was well known to the medical and nursing staff and had several primary nurses that routinely took

care of her before concerns arose related to discrepancies in her PCA infusions. A SAFTeam consult was also requested for this patient to discuss these medication concerns.

Clinical findings

About a month prior to the date in question there was documentation in the patient's chart that she had pushed her PCA pump button 284 times in a 12 h shift and had received 47 doses of medication in addition to two clinician boluses. The patient also had a history of refusing to wear the leads for cardiorespiratory or pulse oximetry monitoring which is defined as standard practice in the hospital policy for patients on opioid infusions and is a common safety practice. About a week before the events in question, the nurse found this patient in her room scrolling through the PCA pump menu options and reported the patient was upset because the previous clinician bolus administered was less than the maximum possible dose ordered. A few days later, another nurse escalated her concerns around the IV medication lines being clamped when they were previously checked and unclamped. All of these findings were documented in the medical record of the patient.

Timeline

On the day of the event the PCA pump was alarming "air in line" but the pump still showed there should be more than 100 ml remaining. The medication cassette was removed to find it totally empty of any remaining medication. The nurse began looking into the pump history and noticed discrepancies between what the pump indicated had been delivered and what was documented as delivered in the electronic medical record by the nurse (see Table 1). There were twenty-seven suspicious actions on the PCA pump over the twenty hours prior to the medication running out that were investigated. Based on pump programming history it appears the pump was programmed for these actions, including changing not just doses delivered but also clearing the doses administered and adjusting the volume of medication remaining. This all went undetected by the nurses since it is not a routine part of the workflow for nurses to verify the full history on the pump. Nurses check the pump every two hours at minimum to clear the number of PCA doses demanded, the number of doses actually given, any clinician bolus doses given and the total volume infused. Nurses are required to check the pump settings (dose amounts programmed in the pump) with another nurse at the start of each shift and with any order or programming changes. The pump has a secure code that must be entered to allow for any programming changes and this should only be known by hospital staff that are licensed to administer controlled substances (nurses, providers, anesthesia, pain team members). On two occasions overnight the nurse documented clearing the pump of volumes that were higher than should have been administered and these were documented in the patient record but the discrepancy was not detected or escalated at that time.

Based on review of the pump record and after several weeks of investigation it is presumed the patient diverted over 137 mg of Morphine off of her PCA pump in the twenty-hour period above and beyond what the nurses documented and accounted for. The assumption is that the patient herself received all of the unaccounted for medication. During the investigation it was reported this patient was sleeping deeply when the nurse went into the room during the night. Once the pump was sequestered and a new pump placed in the room, the programming code for the new pump was changed so it was different than the one used on the original pump. The patient later mentioned knowing the code had been changed; which should not have been something the patient was aware of unless she attempted to access the pump with the standard old code or someone told her it was changed.

After the discovery of unaccounted for medication in the PCA pump a staff member (sitter) was ordered to be at the bedside to monitor the patient and the locked medication infusion around the clock. The nursing manager engaged the Drug Diversion Prevention Specialist to help investigate and the SAFTeam was consulted about the concerns around the PCA pump.

After IV opioids were stopped, the patient struggled with the plan of care for over a week. Patient reportedly told her nurses she wanted to go home since hospital staff "were not doing anything for her", she stated she felt bad and she was being accused of doing bad things but was vague in her discussions with nursing staff. Staff continued to offer the

Table 1
Discrepancies Found on the PCA Pump of Patient B (All Unaccounted for in Record).

Time	Morphine Dose	Pump Action	Deviation
1:42 pm	6 mg	Clinician Bolus	2 mg above ordered dose
1:49 pm	(15 mg)	Cleared from Pump	No documentation
7:16 pm	5.5 mg	Clinician Bolus	1.5 mg above ordered dose
9:47 pm	7.5 mg	Clinician Bolus	3.5 mg above ordered dose
9:58 pm	(9.4 mg)	Cleared from Pump	No documentation
2:50 am	1.3 mg	PCA dose	0.3 mg above ordered dose
2:57 pm	1.3 mg	PCA dose	0.3 mg above ordered dose & administered 3 min before pump lockout time
3:04 am	1.3 mg	PCA dose	0.3 mg above ordered dose & administered 3 min before pump lockout time
3:10 am	8 mg	PCA dose	7 mg above ordered dose & administered 4 min before pump lockout time
3:19 am	10 mg	PCA dose	9 mg above ordered dose & administered 1 min before pump lockout time
3:25 am	(21.9 mg)	Cleared from Pump	No documentation
3:38 am	10 mg	PCA dose	9 mg above ordered dose
3:46 am	10 mg	PCA dose	9 mg above ordered dose & administered 2 min before pump lockout time
3:52 am	(20 mg)	Cleared from Pump	No documentation
3:59 am	10 mg	PCA dose	9 mg above ordered dose
4:17 am	10 mg	PCA dose	9 mg above ordered dose
4:56 am	7.3 mg	Continuous Rate Change	No continuous rate ordered
4:57 am	10 mg	PCA dose	9 mg above ordered dose
5:06 am	10 mg	Continuous Rate Change	No continuous rate ordered
5:10 am	10 mg	PCA dose	9 mg above ordered dose
6:09 am	10 mg	PCA dose	9 mg above ordered dose
6:32 am	10 mg	PCA dose	9 mg above ordered dose
6:53 am	10 mg	PCA dose	9 mg above ordered dose
7:53 am	4.95 mg	PCA dose started but unfinished	Inappropriate dose & Pump Programming
8:49 am	5.7 mg	PCA dose started but cancelled during infusion	Inappropriate dose & Pump Programming
9:01 am	0.1 mg	10 mg PCA dose attempted	Air in line stopped infusion of 9 mg more than ordered dose
9:08 am	5.9 mg	PCA dose started but cancelled during infusion	Inappropriate dose & administered 3 min before pump lockout time

patient support. Patient complained of physical, mental and emotional pain during this time.

Diagnostic assessment & therapeutic intervention

Both of these patients were dealing with chronic challenging diagnoses and chronic pain. There were often times no clear treatment plans and management of overall symptoms and pain was challenging. Patient B had a life limiting prognosis and was struggling with accepting that. Since the concerns presented in these cases were more specific to findings related to medications, supplies, pump issues and some behaviors there was limited discussion about other potential diagnoses to consider. However, there was good reason to consider if there could have been someone other than the patients who was diverting the medications. Investigators considered family members, caregivers and other staff as potential diverters but no evidence was found to suggest anyone other than the patients themselves were diverting the medications.

After identification of risks for inappropriate opioid use and diversion both patients were weaned off of their intravenous opioid medications. After consultation with the chronic pain service, both patients were transitioned to longer acting oral opioids and non-opioid therapies. Both had one on one staffing to observe for any risky behaviors and to monitor for safety while in the hospital. There was some ongoing safety planning and contracting with Patient A who eventually received a referral to addiction specialists. Both patients' primary care providers were contacted and provided with information on the hospital team's concerns.

Follow-up and outcomes

There were interventions with Patient A and Patient B to work on skills to manage their pain with alternative treatments. Additionally, there was anger and denial from both patients and their parents, including frustration with the treatment team and both preferring hospital discharge in the short term to seek care elsewhere or return home. Both patients required ongoing work with the care team to reestablish therapeutic relationships and trust. Patient A was able to reestablish trust with medical leadership so he was able to continue receiving care at the organization and from the specialists who were most familiar with him and his healthcare needs. Unfortunately, Patient B struggled more to reestablish ongoing care relationships with the team and sought care from other facilities. Patient B would return to this hospital off and on but often left against medical advice or would request discharge because she felt she was not getting the medications she needed.

Discussion

There was no opportunity to obtain the patient perspective on either of these case reports. Informed consent was not obtained from either patient to be included in this case report, therefore more descriptive details of the patients and their medical conditions has been avoided to better protect the identity of both patients.

Literature suggests that there are behaviors that may be apparent in young adults and adolescents that may not necessarily be indicative of abuse or misuse of opioids, but should be considered as part of the assessment and evaluation of risk and potential need for ongoing support. Concerning behaviors include patients requesting specific drugs, third-party concerns over opioid use or requests to manage patient's medications for them, missed, cancelled or unscheduled appointments for follow up with pain care provider or seeking care from multiple providers (may include urgent care or emergency care), excessive phone calls or attempts to obtain treatment or refills without in-person visits, reporting lost or stolen prescriptions or actual medications, discrepancies in pill counts, resisting changes to medication regimen, non-prescribed changes in dose or frequency, combinations of medications or substances to achieve desired effects, use of medications to treat symptoms for which those specific medications are not indicated for, patient purposely over sedating oneself or admitting to wanting the euphoric effects from the medications, decreased functioning in activities of daily living, hoarding medications, stealing or selling prescription medications, obtaining opioids from nonmedical sources and tampering or forgery of written prescriptions (Ehrentraut et al., 2014). Patients who are misusing opioids may exhibit physical symptoms such as fatigue or drowsiness, altered consciousness (fading in and out), constricted pupils, flushed skin, dry mouth, itching, nausea, vomiting, constipation, dizziness, headaches, sweating, mood changes or slowed breathing (Partnership for Drug Free Kids, 2018; HHS, 2019).

Based on use and misuse of prescription medications it is important that health professionals, including pediatric nurses, understand their role in inquiring about possible substance use and provide education about risks of illicit use and diversion of prescription medications while being aware of both the medical and behavioral signs of potential substance use (Kulig, 2005; McCabe et al., 2006). Prescription drug abuse screening questions should be included into standardized screening practices in healthcare settings to help identify medical and non-medical use of prescription drugs (Madras, Compton, Avula, Stegbauer, Stein, & Clark, 2009). Healthcare providers may have barriers to screening and management of substance abuse including time constraints due to high patient volumes, inadequate reimbursement for time required to address substance use, fear of alienating or labeling patients, inadequate education or training around substance use and addiction and lack of knowledge about treatment options and access to referral resources (Kulig, 2005). These barriers are challenging to overcome and put pressure on providers to develop skills and knowledge in a content area with which they may be unfamiliar or uncomfortable. Providers and nurses, if prepared, can help to identify risks and provide information on services and resources. However, to have effective harm reduction approaches to address adolescent opioid use there may need to be shifts in school and community norms and support of public health efforts to respond to adolescent substance use (i.e. safe needle programs, outreach and education, treatment resources and information sharing) (Marshall et al., 2016; Toumbourou et al., 2007). Fostering efforts to address adolescent use of opioids and other prescription medications will require engagement of clinicians, schools and families (Young et al., 2012).

There are also resources available such as the prescription drug monitoring programs (PDMP) that allow prescribers to view previous and current prescriptions for their patients prior to making decisions about new prescriptions. Use of tools, like the PDMP, should become a routine part of any provider's prescribing practices for opioids and other controlled substances. Many states now require the use of PDMP by providers prior to prescribing opioids. Providers who prescribe also have the responsibility to educate adolescents and their caregivers about the risks of misuse and diversion (Young et al., 2012). The quantity of prescription opioids for adolescents should be considered and monitored to avoid leftover medication that can be misused (McCabe et al., 2012) and education should be given to encourage prompt and safe disposal of any unused medications (Allen et al., 2017).

Additional take away lessons for nurses working in acute care settings include monitoring for patients exhibiting potential drug seeking behaviors. Some of these behaviors and signs include: asking for pain medications before they are due or at the exact time they can be received again, asking for medications to be infused quickly or pushed instead of infused at a slower rate, manipulation of medications/pumps or patient's found to be touching pumps, familiarity with pump settings or pump history, storing up doses of medications, missing syringes or IV flushes, regularly unexplained line infections, change in mentation, sleeping more or deeper sleep than typical, in general being less alert or less engaged in care and any IV medications being infused more rapidly than programmed by nurse or these medications running out before expected. These cases are often not well documented and data is rarely collected on the ramifications of PCA diversion occurring in

hospitals; fortunately some have identified similar cases and have begun publishing their findings which helps promote awareness to the risks involved to hospitalized pediatric patients (Donado et al., 2019).

Practice implications

The pediatric nurse may only occasionally care for patients with chronic pain and even more rarely care for those with opioid use disorder or opioid seeking behaviors. Given the literature concerning risky medication use in this population, caring for one of these patients during a hospital admission is a clear opportunity for the pediatric nurse to identify behaviors and signs of potential addiction. Documenting concerns and discussing potential implications with the care team is crucial to identifying patients at risk for opioid use disorder. Nurses must communicate their assessment findings and concerns to the rest of the team and, if a pattern emerges, they need to help ensure interventions are available to help support the patient.

Conclusion

Undoubtedly, limiting exposure to opioids for adolescents when possible is one way to help decrease the chances of long-term use and/or future non-medical use or misuse. Prescribers have specific responsibilities to ensure patients are educated about proper use, storage and destruction of prescription opioids and other high risk medications. Nurses play an important role in detecting concerning behaviors and in providing ongoing education and support to patients and their families. An astute nurse in an acute care setting may be the one who notices concerning behaviors during a hospital admission. A nurse in an ambulatory or emergency room visit may have conversations with the patient that highlight potential risks for misuse of prescription medications. In any scenario, these nurses should speak up and engage the parents/caregivers if appropriate and the treatment team. Substance use goes far beyond healthcare and can have significant impacts on the education setting and all other aspects of the adolescent's life. Diversion of medications by patients, which is what was described in the cases of Patient A and Patient B, in the hospital setting is rare; it is more likely seen in areas or practices were there is an increased use of controlled substances or by providers who are prescribing or administering these medications. Drug diversion prevention programs within hospitals, either based in Pharmacy or Compliance departments in most hospitals, are one resource to help investigate possible patient diversion cases. Organizational leaders should also consider the need for addiction specialists and assist providers with having access to referral sources and information for ongoing treatment of adolescent substance use.

Substance use and misuse is still highly stigmatized and few people receive the necessary treatment they need. There are trends to begin recognizing substance abuse as a chronic illness and beginning to align resources around the long term nature of this issue. The complexity of the issue warrants further research and partnerships to continue to combat the epidemic. There is a dearth of information related to the implications and risks for addiction among adolescents with chronic pain and hospitalized pediatric patients that may divert medications while in acute care. These two cases highlight a gap in the literature and suggest additional research is needed. Increased mental health access, programs and funding as well as improved insurance coverage for substance use are all necessary but beyond the scope of this paper. Having conversations about substance use and misuse of prescription medications are not easy ones to have with adolescent patients but are a place to start and should be routine practice for nurses and providers. Nurses will likely need support and training on how to have these conversations and how to respond if concerns are identified. If the pediatric healthcare community cannot begin by routinely talking about substance misuse, the community will never effectively address the issue.

Author statement

I, Heidi McNeely, am the sole author on this manuscript. I have completed the preparation, drafting and editing of this entire manuscript. Some minor editing support was provided by my colleagues; no other significant contributions were made on the work put into this publication by anyone other than myself.

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